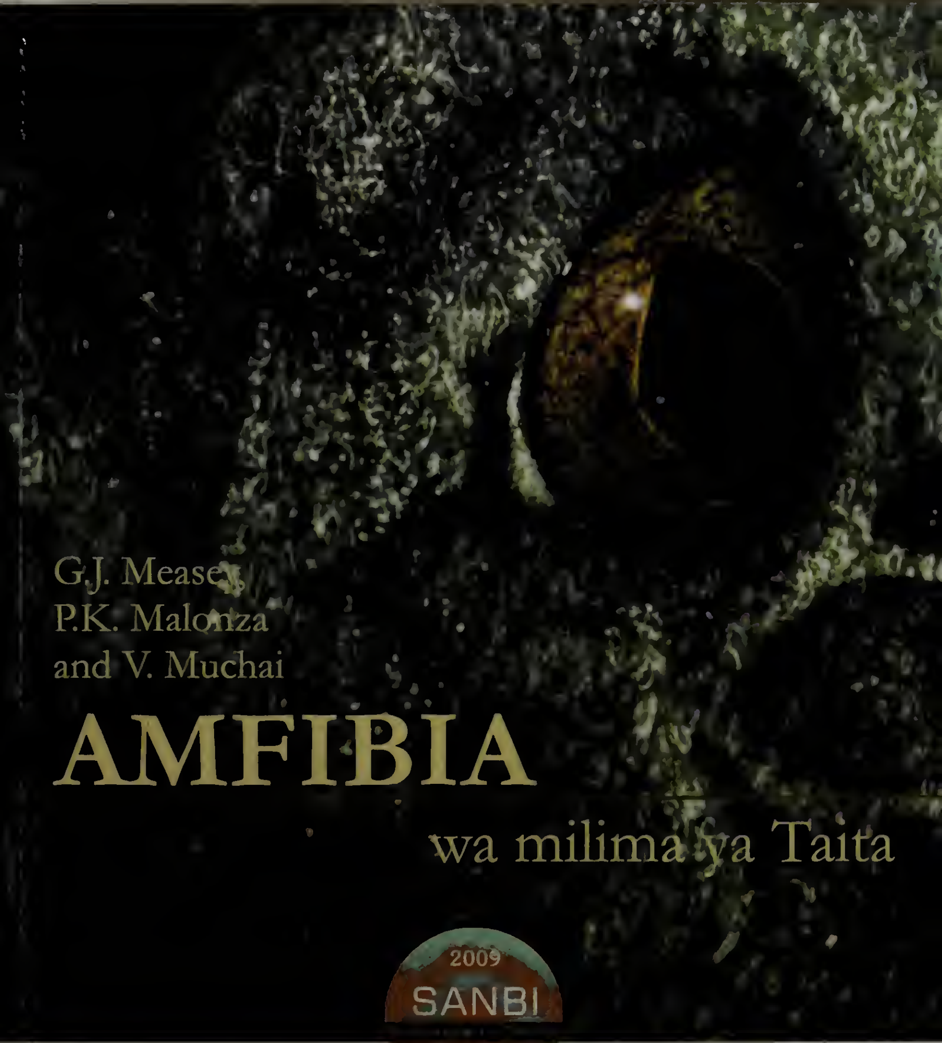

G.J. Measey
P.K. Malonza
and V. Muchai

AMFIBIA

wa milima ya Taita

2009
SANBI
12

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	kidimbwi
	mto
	kijito
	ndani mchangani / chini ya ardhi
mchana / usiku	mchana
	usiku
mwinuko kutoka ufuo wa bahari	nyanda za juu
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aina ya mimea	bustani
	msitu
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Amfibia wa milima ya Taita

na

G.J. Measey, P.K. Malonza na V. Muchai

SOUTH AFRICAN
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biodiversity
institute
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Halimashauri ya kitaifa ya bioanuwai ya Afrika Kusini (SANBI) iliazishwa tarehe moja Septemba 2004 wakati sheria ya kulinda mazingira: Inayozingatia mazingira (NEMBA) namba kumi ya mwaka 2004 ilipotiwa sahihi na rais Thabo Mbeki. Hii sheria inapanua mamlaka ya kile halimashauri ya kushughulikia mimea kuhusisha jukumu la kuangalia wanyama na mimea ya Afrika Kusini na inahushisha mipango ambayo inatambuliwa kwa kulinda, kutafiti, kuelimisha na huduma za wangeni iliyotayalishwa na halimashauri ya kushughulikia mimea na mashilika tangulizi katika karne iliyopita.

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Utangulizi

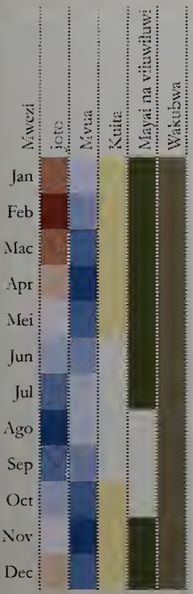
Kitabu hiki ni nakara ya amfibia wanao patikana katika Milima ya Taita. Amfibia ni baadhi ya wanyama wasiojulikana sana na pia hawavutii kwa sababu ya miili yao inateleza. Wao pia ni baadhi ya wanyama wanaokabiliwa na tishio la kunangamia kutokana na mwingilio na wa binadamu. Kitabu kitasaidia kuwafahamu amfibia na umuhimu wa kuwalinda. Ni matarajio yangu kuwa hiki kitabu kitawasaidia wasomaji kuanza kuwatambua amfibia na umuhimu wa kuyalinda mazingira yao na haswa misitu ya kiasili ambayo inategemewa na wengi wa viumbe hawa. Natumai kuwa utapata kujivunia (kama ninavyo) kwa kufahamu kuwa wanyama hawa hupatikana tu Taita na sio mahala pengine ULIMWENGUNI KOTE.

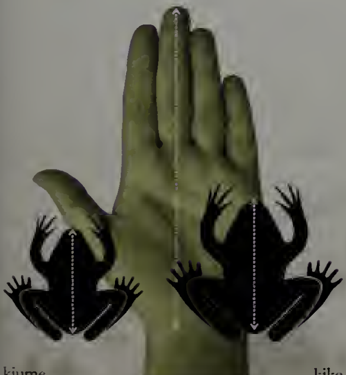
Tunaishi mahali penye utajiri mwingi na pa kuvutia ambapo pengine palikuwa pazuri zaidi kabla hatuja ukata msitu wa kiasiri. Kulingana na wanasayansi Milima ya Taita imepoteza zaidi ya asilimia tisaini na nane ya musitu katika kipindi cha miaka 200 iliyopita. Ni wajibu wetu kuona kuwa hakuna uharabifu mwingine unaotokea lakini tujaribu kurejeshe umaridadi wa hii sehemu kadri tunavyo weza. Hii pia itakuwa ni faida kwetu kwa njia kadhaa kama kupata maji zaidi, kuimalika kwa mavuno ya chakula na pia kulinda uhaiwai huu tunao wa kipekee.

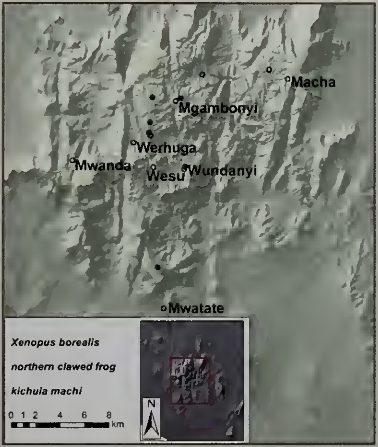
Bidii na kujitolea kwa waandishi kumezaa matunda ya kazi iliyo kamilika na kwa hakika itakuwa ya manufaa kwa wasomaji.

James Mwang'ombe
Project Coordinator
The East African Wild Life Society
10 October 2008

Maelezo







Kalenda hii inaonyesha mabandiliko ya mwezi kwa mwezi ya mvua na joto kwa vivuli vya samawati na nyekundu. Mishoro ifuatayo inaonyesha wakati kiume wanaita, wakati mayai na viluwiluwi wanapatikana, na mwisho wakati chura wazima upatikana

Urefu wa wastani wa kiume na kike imepewana kwa kulinganisha na kiasi cha mkono wa kawaida. Chura mnaowapata waweza kuwa wadogo ama wakubwa kuliko kiasi cha wastani

Ramani hii inaonyesha sehemu ambazo tumewapata aina hizi za amfibia. Inawezekana kuwapata sehemu zingine na tunawapa changamoto muwatafute!

Shukrani

Tunashukuru shirika la "Critical Ecosystem Partnership Fund" kwa uchapishaji wa hiki kielezo.

CRITICAL ECOSYSTEM
PARTNERSHIP FUND

Kimetafsiriwa toka kingereza hadi kiswahili na Ahmed Omar (Makavazi ya kitaifa ya Kenya).
Tunamsukuru sana Muthama Muasya (Chuo kikuu cha Cape Town) kwa usaidizi wake kwenye sehema ya swahili

Mwenye picha: Picha zote zime tolewa na mwandishi wa kwanza isipokuwa:

Ukurasa 3:	Mwangi Githuru:	*Turdus helleri*
Ukurasa 8:	César Barrio:	*Salamandra algira*
Ukurasa 23:	Anthony Herrel:	*Callulina dawida* alama
Ukurasa 49:	Alan Channing:	*Amietia angolensis*
Ukurasa 54:	Alan Channing:	*Kassina senegalensis*
Ukurasa 71:	Krystal Tolley:	Homo sapiens JM

Bioanuwai

Bioanuwai ni tamko linalo onyesha tarakimu za aina ya viumbe walio katika sehemu fulani. Katika sehemu za nchi zilizoendelea tarakimu za viumbe hujulikana kwa maana wanabiologia wamekuwa wakifanya utafiti kwa muda ilihali sehemu zingine hazijafanyiwa utafiti wa kutosha na huwa na bioanuwai isiyojulikana kiwango chake. Katika mwaka wa 1999 wanasayansi walichunguza mielekeo ya bioanuwai duniani na kuamua kuwa eneo zingine ni spesheli na zina idadi kubwa ya viumbe kwenye sehemu kidogo. Haya maeneo yanajulikana kama 'Maeneo makuu ya Bionanuwai'. Kati ya maeneo makuu 12 ya bioanuwai yaliyotabuliwa moja linaitwa 'Ukanda wa milima ya mashariki na misitu ya pwani' katika Afrika Mashariki.

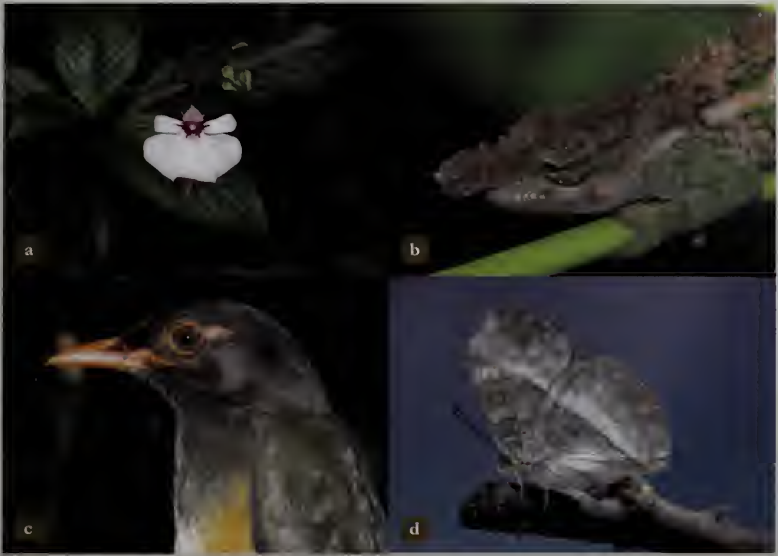
Eneo la ukanda wa milima ya mashariki linaanzia kule Udzungwa huko mbali Kusini mwa Tanzania mpaka Milima ya Taita, Kusini mwa Kenya. Milima katika hii sehemu ina umri mmoja (karibu miaka milioni mia mbili) na imekuwa ikitega mvua inayotoka Bahari Hindi. Hii inamaanisha kuwa hii milima imeweka joto na hali ya unyevu ambao huhitajika ili kutunza misitu ya kiasri mamilioni ya miaka kabla ya wanadamu kuishi katika sehemu hii. Katika kipindi hiki kirefu hali ya anga haikuwa imara kwa ajiri ya kupitia misimu mingi ya unyevunyevu na kiangazi, kila moja ikidumu miaka elfu nyingi. Matokeo yake ikawa ya kwamba sehemu za chini za milima zilifanyika misitu (wakati wa mvua) na tena kufanyika nyika (wakati wa kiangazi). Milima ya Ukanda wa Mashariki ilikaa msitu kwa muda huu wote, kwa hivyo misitu ikawa inashikana wakati wa mvua na kutengana wakati wa kiangazi. Hii ilipea nafasi wanyama na mimea inayoishi katika misitu kutembea na kuenea kati ya milima na kutengana wakati wa kiangazi. Ebu fikiria kama lile eneo lote lilikuwa na sasa hawa wanyama wote wanasukumwa katika sehemu za misitu juu ya milima!

Saa hii, tunaishi wakati wa kiangazi ulimwenguni na nyika huwa kizingiti cha wanyama na mimea wote wa msitu kutoweza kutembea kati ya milima ya Ukanda wa Mashariki. Inaaminika kuwa mabadiliko mengi ya kuungana na kuachana kwa Milima ya Ukanda wa Mashariki ilichangia kuwepo kwa idadi kubwa ya aina ya viumbe wanaopatika katika eneo hili maalum la bioanuwai. Wakati huu (na wakati wa kiangazi hapo mbeleni), Milima ya Ukanda wa Mashariki imekuwa hifadhi ya

Sehemu zilizokuwa zimefunikwa na misitu sasa ni tupu na zina vijisehemu tu kidogo zenye miti ya kingeni.

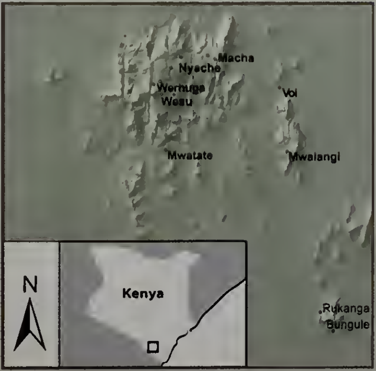
Sehemu za chini katikati mwa milima ya ukanda wa mashariki, mvua ni ya kiwango cha chini.

maelfu yawanyama na mimea wa aina tofauti ambao hawawezi kuishi nyikani. Hii milima ni kama visiwa vinavyozungukwa na bahari ya nyika. Kwa vile aina tofauti za wanyama na mimea wametengwa kwa maelfu ya miaka, hawa viumbe wamekuwa spesheli na wengi hupatikana kwenyesehemu za juu za kila mlima. Milima ya Ukanda wa Mashariki ina viumbe wengine ambao hawapatikani mahali pengine ulimwenguni na kati ya wanyama wote wenye uti wa mgongo ni amfibia ambao ni wengi, pengine ndio wengi kabisa Afrika.



Baadhi wanyama wapatikanao Taita peke yake. a, Taita-chanua (*Impatiens taitana*); b, Taita kinyonga (*Kinyongia boehmei*); c, Taita ndege (*Turdus helleri*); na d, Taita kipopo (*Cymothoe teita*).

Isiwe ya kustaajabisha kuwa Milima ya Taita iko na wanyama na mimea wengi wasiopatikana mahali pengine duniani. Hawa ni pamoja na ndege, mmea maua, vipepeo, na wengine. Hiki kitabu ni kuhusu amfibia wa Milima ya Taita hata kama wanapatika mahali pengine pia lakini tutashughulikia wale wapatikanao hapa peke yake. Tutaangazia pia mahali wanaishi na jinsi tunaweza kuwatambua. Ni matarajio yetu kuwa unapofahamu vile wanavyokaa utasaidia katika kuwalinda na kuwatunza hawa wanyama wa ajabu na spesheli.



Milima ya Taita iko kusini-mashariki mwa Kenya, kilomita 160 kaskazini-magharibi mwa bahari hindi.

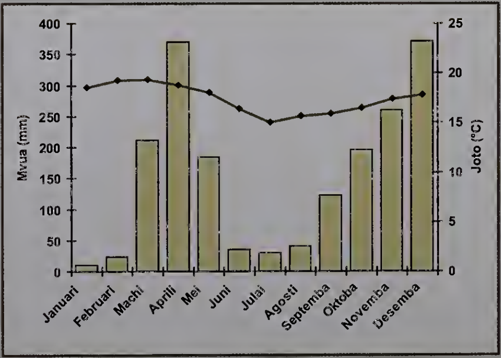
Hali ya anga Taita

Sehemu yote ya Afrika Mashariki hupata misimu miwili ya mvua kwa mwaka. Mvua ya Masika ambayo ndiyo nyingi ni kutoka mwezi Machi hadi Mei na pia mvua kiasi 'Vuli' kutoka Oktoba hadi Desemba. Wakati wa msimu wa kiangazi, mvua kidogo huwa inanyesha mara kwa mara na kwa hivyo hakuna mwezi ambao hakuna mvua. Kado na mvua, kuna kipindi kimoja cha baridi (Julai) na Februari ndiyo mwezi ambao kuna joto jingi zaidi.

Mvua

Sehemu kadha za Taita hupata mvua na zingine huwa zimekauka. Kwa ujumla, sehemu zilizo inuka huwa na unyevu kwa kuwa zina uwezo wa kutega mawingu ya mvua yanayopita (Kwa mfano Mghange na Vuria). Lakini sehemu zingine ziko katika upande wa pili wa mlima ambao huchukua mvua yote kutoka kwa mawingu. Mvua hutoka kwa Bahari Hindi iliopo kusini mashariki, kwa hivyo sehemu zilizoko kaskazini magharibi mwa Taita na nyuma ya milima hupata mvua iliyopungua. Mfano ni sehemu ya Irizi ambayo ni kavu ingawa iko sawa na Wundanyi kutoka ufuo wa bahari na hupata mvua zaidi. Irizi iko upande wa kivuli cha mvua mwa Ngangao ambayo huchukua asilimia kubwa ya mvua kabla ifike Irizi.

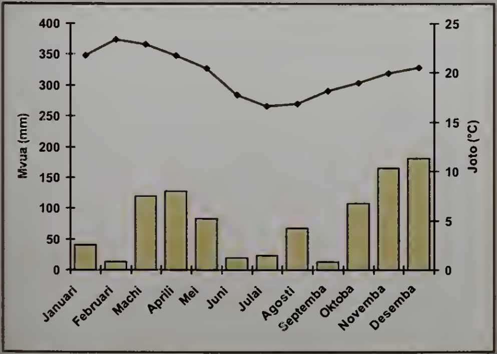
Miaka tofauti pia iko na viwango tafauti vya mvua na inaweza adamana na ngurumo za radi wakati wa kiangazi. Mfano mzuri ni mwaka 2007 wakati mvua isiyo kwa msimu iliyofikia kiwango cha 100 mm



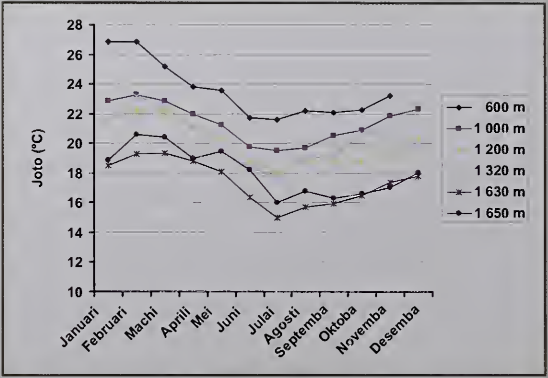
Tarakimu za mvua na joto huko Mwachora mwaka 2006 (ilinakiliwa na Oliver Mwakio). Mlima Mwachora huko juu kidogo (mita 1 630 kutoka ufuo wa bahari) na hupata mvua nyingi.

Katika kivuli cha mvua. Ingawa sehemu hii iko mita 1 400 kutoka ufuo wa bahari bado ni kavu na miti na amfibia wachache pia.

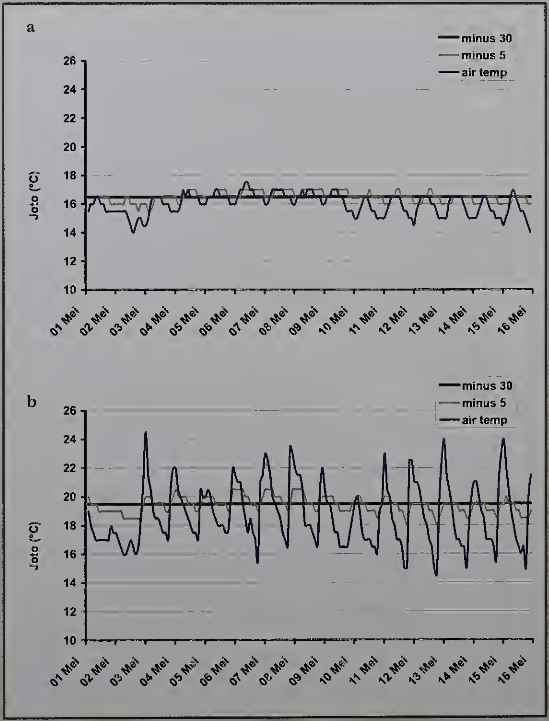
ilinyesha katika sehemu nyingi za Taita. Nyakati za kiangazi hupata mawingu ambayo huleta mvuke kwa sehemu zilizoinuka. Misitu ya kiasili huwa na faida ya kutega huu mvuke ambao hutiririka mpaka kwa mizizi. Hii inamaanisha katika misitu ya kiasili mchanga huwa na unyevu na mito inakuwa na maji kwa mwaka wote ikitimiza mahitaji ya maji kwa watu wanaozunguka msitu. Mashamba ya eucalyptus ni



Tarakima za mvua na joto kutoka Chawia katika mwaka 2007 (imenukuliwa na Christopher Ngeti). Chawia iko na mita 1 604 kutoka ufuo wa bahari na ina urefu karibu na Mwachora lakini hupokea mvua kidogo kwa sababu iko nyuma ya Mlima Iyale.



Tarakimu za joto kutoka Jora (600 m kutoka ufuo wa bahari), Piringa (1 000 m) Sagalla (1 200 m), Mbololo (1 320 m), Mwachora (1 630 m), na Ngangao(1 650 m) mwaka wa 2006. Kadri sehemu ilivyo juu ndivyo joto inavyo pungua lakini sehemu zote zina hali sawa ikiwa na vipimo vya juu mwezi wa Februari na vipimo vya chini zaidi mwezi wa Julai.



Tarakimu za joto kutoka (a) msitu wa Ngangao na (b) shamba moja Wundanyi katika siku 15 za kwanza za mwezi Mei 2006. Utaona vile joto ya hewa (samawati) inabadilika sana ili hali joto mchangani (kijani kibichi) haibadiliki sana, ili hali chini ya ardhi kabisa (hudhurungi) joto haibadiliki. Hali ya joto msituni hukingwa kutokana na mabadiliko na miti ili hali joto hewani huko kwa mashamaba hupanda na kushuka.

Utaona kwamba tarehe tisa Mei kulikuwa na mawingu (na mvua nyingi) lakini tarehe 10, 11, na 12 Mei kulikuwa na jua na joto.

mbaya kwa sababu hunyonya na huelekeza maji ndani ya ardhi. Vijito vilivyokuwa vikitiririka katika sehemu zingine vilikauka baada ya eucalyptus kupandwa. Hali hii hasa iko mbaya kwa eneo la Sagalla hivi kwamba maji hayawezi kuchimbwa chini ya ardhi wakati wa kiangazi.

Joto

Kuna uhusiano wa moja kwa moja kati ya joto na mwinuko kutoka ufuo wa bahari hivi kwamba sehemu zilizo na joto zaidi ziko chini na zile ziko juu kwa milima ni baridi zaidi.Vipimo vya joto hubadilika kulingana na uwepo wa mawingu (baridi nyingi mchana na joto usiku) au hamna mawingu (joto jingi mchana na baridi usiku). Hali hii pia hubadilika kulingana na mimea iliopo. Mtu akitembea kwa msitu huhisi baridi lakini usiku huwa na joto zaidi kuliko mashamba kwa vile hutega joto ya machana.

Kuna tofauti kubwa baina ya viwango vya kila siku kati ya mahali tunapoishi na mashamba yetu na ardhi chini ya miguu yetu. Kama vile ungetarajia viwango vya joto kwenye chini ya ardhi huwa havibadiliki, na unapotokea juu ya ardhi ni dhahiri kwamba waweza kupata tofauti kila siku. Kuna tofauti pia baina ya shamba na msitu. Uwepo wa kivuli cha msitu hufanya hewa kuwa baridi hata wakati wa joto. Wakati wa usiku, hewa iliyoko ndani ya msitu haibadiriki na kuwa baridi kama ya nje hivyo basi msitu huhisi joto.

Amfibia hupata joto ya mwili kutoka kwa mazingira yaliyo yazunguka, kama ilivyo reptilia na wanyama wasio na uti wa mgongo. Hii inatokana na jina ‘ectotherm’ likimaanisha nje (ecto) na joto (therm). Amfibia huhitaji mazingira yaliyo na joto na unyevu hivyo basi wingi wa mvua na joto huku milima ya Taita ni mzuri kwao. Hakika mastakimu yale wanapopatikana huwa na tofauti kubwa baina ya joto na unyevunyevu. Misitu ya kiasili ni sehemu zilizo na vipimo vya joto visivyo badilika na huwa nyevu. Viwango vya joto kwenye mashamba yaweza kubadirika na kuwa kavu sana ama kuloa. Hivyo basi jamii tofauti za amfibia hupatikana kwenye misitu na mashamba, ili hali wengine hupatikana sehemu zote mbili.

Mvua unyesha ndani ya msitu kali ambapo joto iko imara.

Amfibia

Amfibia ni viumbe wenye uti wa mgongo walio na ngozi spesheli yenye unyevu na ambayo wanatumia kupata hewa ya oksijeni na pia kuwa na mapafu mawili kama wanadamu. Wao hutaga mayai ambayo yana ute mzito na hayana kauri ngumu. Hii inamaanisha amfibia hushirikishwa na maji.

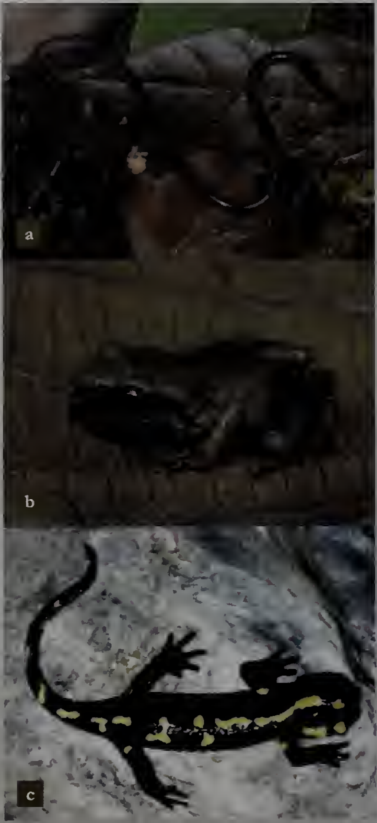
Duniani kuna aina tatu wa amfibia wanaojulikana kama chura, salamanda na cicilia. Afrika chini mwa Sahara kunapatikana tu chura na cicilia na wote hupatikana kwenye milima ya Taita.

Kuangua

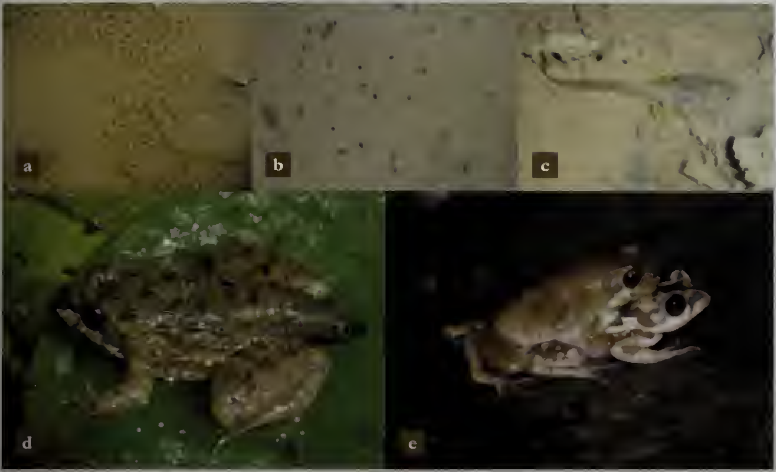
Shuleni huwa tunafundishwa juu ya maisha ya amfibia ikiwa: mayai ambayo yana ute mzito hutagwa kwa maji na huangulia na kuwa viluwiluwi. Hivi viluwiluwi huwa wakubwa, hupata miguu na mwishowe mkia hupungua na miguu kuwa mikubwa na kuwa kichura ambaye hugeuka na kuwa chura mkubwa.

Makwapa

Kwa chura wengi, dume hushika kike kwa kiuno ama nyuma ya miguu ya mbele kabla ya kutaga mayai na utungisho. Hawa chura walioshikamana husemekana wako kwa makwapa (Kilatini ikimaanisha kukumabtia) kwa kiuno au makwapa matawalia. Hii sio ngono kwa sababu



Picha ikionyesha mifano ya amfibia tofaouti – a, cicilia; b, chura; c, salamanda.



Michoro na picha kuonyesha viwango tofauti vya kukua kwa chura – a, mayai; b, viluwiluwi wadogo; c, chura waliokomaa wakiwa kwa makwapa; d, chura mdogo mwenye mkia; e, chura wakiwa kwa ngono.

mayai hayatungwi hadi wanyama waende kwenye mahali pa kutagia mayai, na mutindo wa kushikamana unaweza badilika ili wao wafanye hivi. Pia sio kila chura wa kiume akishika kike lazima atunge mayai yake kwa sababu wa kike wanaweza kuwakataa, au dume zingine zinawazindi nguvu na kuwatoa kwa makwapa.

Kwenye milima ya Taita sio vingumu kuona mpangilio huu wa maisha ya chura. Hebu jaribu kuangalia katika kindibwi ama shimo lenye maji wakati wa mvua, kwanzia Juni hadi Septemba haya maji hukauka ikimaanisha hawa chura huwa na muda mfupi wa kuzaana unaoambatana na msimu wa mvua.

Chura wa kiume hupiga kelele kufahamisha wale wa kike mahali walipo na kila aina ya chura huwa na mlio wa kipekee. Watu wengi wanajua hizi sauti hata kama saa zingine hawajui kama ni chura wanotoa hizi sauti! Wakati mvua inapoanza (Oktoba na Novemba) hizi sauti ni nyingi na hutoka mahali popote ambapo maji yanakusanyika. Aina zingine za chura huzaana huu wakati peke yake, ili hali wengine huendelea na kutoa hizi sauti na kuzaana wakati wa msimu wa mvua mfupi na ule mrefu.

Chura wa kike huvutiwa na kelele za chura wa kiume na wanauwezo wa kuchagua kutoka chura mmoja kutokana na sauti yake. Akisha

Churamiti wa kiume akiitana.

chaguliwa chura wa kiume (mara nyingi mdogo) humpanda chura wa kike na wao huenda kutaga mayai. Wengine huweka mayai moja kwa moja kwa maji kwa vijikamba, mikusanyo ama kama mikeka inayoelea. Wengine hutaga mayai juu ya majani nje kidogo ya maji ili viluwiluwi wanapoanguliwa waweze kuanguka majini na kuanza kuongelea.

Viluwiluwi hula chakula tofauti na chura wakubwa. Wengi wao hula aina ya mimea midogo ya kijani kibichi ambao hukua kwa wingi kwa maji yasiyo na chumvi, ambayo hupa maji rangi ya kijani ama kupaka vitu vilivyo majini ute wa kijani. Viluwiluwi hula hiki chakula na meno spesheli. Kila aina ya chura huwa na meno aina yake yanayoweza

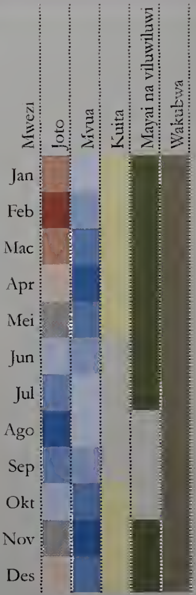
Mayai ya cicilia wa Taita yakionyesha kiinitete kikikua kuzunguka kiiniyai.

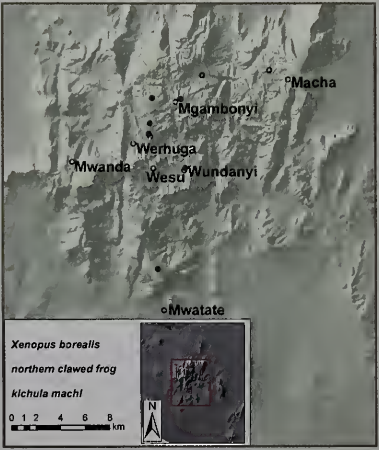
kutumika kumtabua kiluwiluwi gani anakuwa chura aina gani.

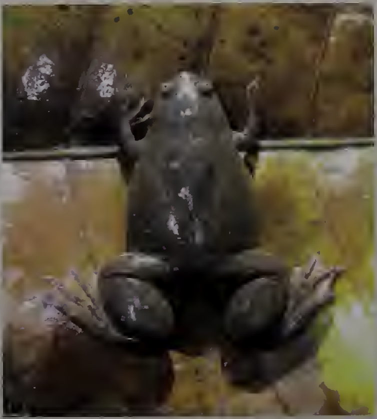
Kuangua moja kwa moja

Sio amfibia wote ambao huwa na viluwiluwi. Aina kadhaa wa chura wa Taita hawatagi mayai majini bali kwa majani yaliyokauka katika misitu au dani ya udongo wenye unyevu. Hawa chura huwa wana faida ya kuwa hawahitaji kuingia kwa maji kuzaana. Hawahitaji kungojea mpaka mvua ndio watage mayai. Hii hali ya kuwa huru na maji inamaanisha wanaweza kuwa mahali popote mara nyingi bali na maji. Mayai yao huwa na ute mzito unaoyazingira kama ilivyoelezwa hapo mbeleni na hii inamaanisha kuwa yanaweza kukauka kwa hivyo lazima chura watafute mahali penye unyevu ili watage mayai. Chura hawa na cicilia ndiyo chura wa ajabu kwa milima ya Taita (tazama ukurasa 3). Hawa ni pamoja na wengine ambao hawapatikani kwingine duniani na maisha yao haikuwa inajulikana kabla ya utafiti wetu. Tunataraji utafurahia kusoma hiki kitabu kuwahusu hawa chura kama tulivyo furahia kutafiti juu ya maisha yao yanaosisimua.

Xenopus borealis

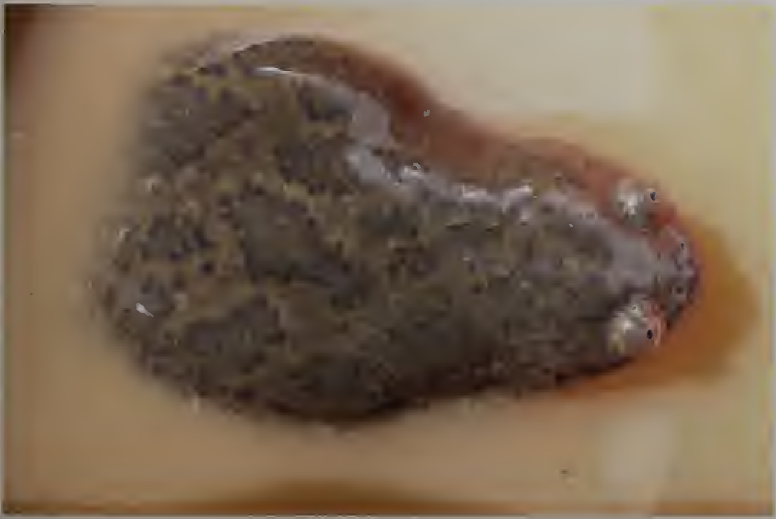






Nje ya maji hukaa chura wa kutisha atembeaye kwa ungumu. Ona miisho ya rangi nyeusi kwa makucha ya miguu.

kichula machi

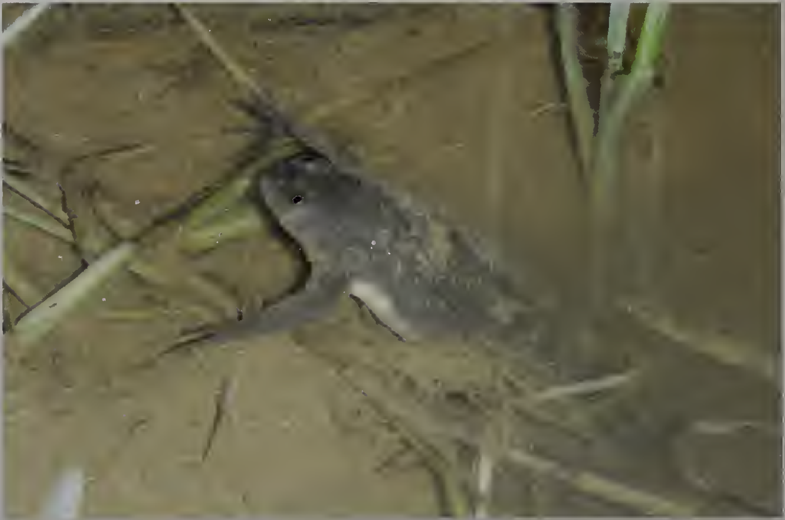


Huyu chura anatokezea juu ya maji yenye matope. Tazama mishono kwa upande kwa mwili na karibu na macho.

Chura wengi wana uwezo wa kutembea nchi kavu na pia kwa maji, na wanaweza kuruka au kutembea haraka kukwepa kushikwa. Chura wenye makucha si wepesi kwa kutembea nchi kavu lakini wao huonekana wakati wa mvua kubwa kwenye nchi kavu wakitemeba huku na huko. Chura hawa pia hupatikana wakitembea kwenye nchi kavu baada ya vidimbwi kukauka ambapo hutafuta makaazi mahala pengine. Ingawaje si wepesi kwa kutembea, wao ni waogeleagi mahiri. Ni rahisi kuwaona wakati wa usiku kwenye vidimbwi na mitaro ya maji hasa ukiwamulikwa na tochi. Ukiwashtua wao hujificha matopeni. Wakati mwingine huonekana wakielea juu ya maji na wakati mwingine hula wadudu wa maji na huruka nje ya maji kuwashika wadudu wanapopita karibu.

Ni vigumu kumkanganya huyu chura na vyura wengine wa Taita. Miguu ya nyuma ni mikumbwa na ina matuta yaliyo na makucha meusi ya mwisho wa vidole vinne vya kwanza

Xenopus borealis (kuendelea)



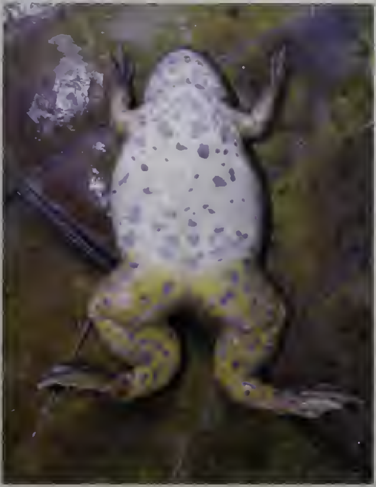
Hawa chura huwa wanakaa kwa maji usiku na vidole vyake vikiwa vimenyooshwa kuhisi mienendo wa kitoeo.

(hivyo kaitwa chura wa makucha). Wao huonekana wamefunikwa na mishono ambayo ni viungo vya kuhisi mazingira yake majini. Wao hutumia viungo hivi kutambua chakula kiliko majini, hii ikiwa ni wadudu, samaki, na viluwiluwi hata vyake pia. Chura hawa wana ngozi nyororo na telezi hivyo basi ni vigumu kuwashika mkononi na hukwaruza sana kwa makucha yao.

Wakati wa mvua kubwa waweza kuwasikia, chura wa kiume huita kwa sauti ya 'brrrrr brrrrr brrrr'

Viluwiluwi wa huyu kiumbe hufanana na samaki wadogo.

ambayo husikika wakati unapokaribia maji. chura wa kiume hukumabatia wa kike katika sehemu zao za manena wawili huogelea wakiwa pamoja wakizunguka kindibwi ilihali wakiweka mayai yao moja moja kwa majani na mawe kubwa ama ndogo. Vuluwiluwi wake hawafanani na wa chura wengine Taita juu huwa wazi na huning'inia kwa maji na mikia yao ikitikishwa kutoka upande mmoja hadi mwingine kwa maji na huchuja chakula kutoka kwa maji. Videvu viwili vikubwa huonekana kwa pembe za mdomo na hufanana na ngogo lakini humea miguu hivyo kujulikana ni chura.

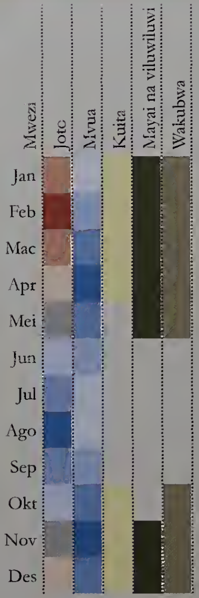


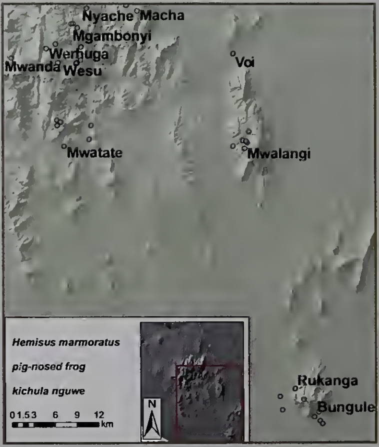
Sehemu ya tumboni ya chura gando wa kaskazini ina madoadoa ya hudhurungi miguuni na mikononi.

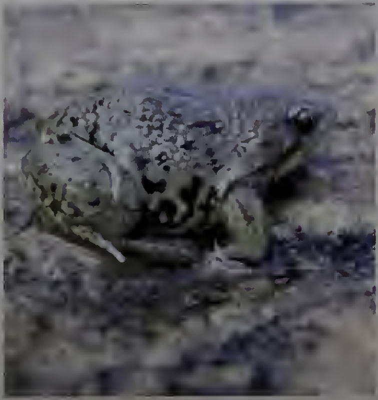
Aina hii ya chura hupatikana kwa maeneo ya juu Kenya, Tanzania na pengine Uganda.

Maelezo ya pembeni

Hemisus marmoratus

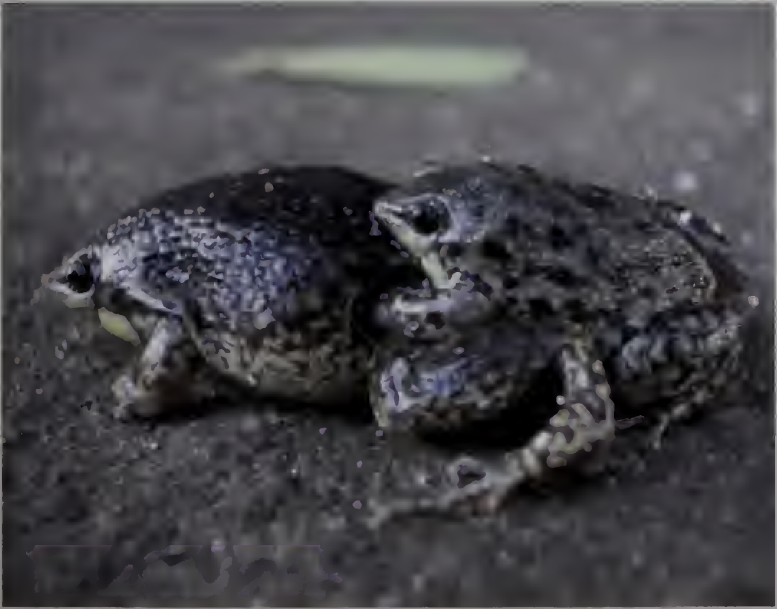






Huyu chura huwa na mapua koda na rangi ya marumaru.

kichula nguwe



Jike ni mkubwa kuliko dume anaye jichimbia mikono yake kwa upande na kuchukua hii nafasi wakati wa makwapa.

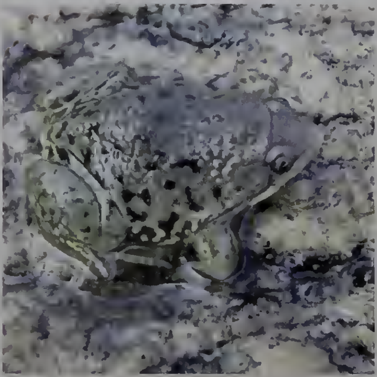
Ni vingumu kukanganya aina hii ya chura kwa wengine wanaopatikana Taita. Yeye hutumia kichwa chake kidogo kinachofanana na cha nguruwe kuchimba mchangani au kwa udongo wakati wa mvua karibu na mito ambapo hukaa mchana. Huyu chura huchimbwa mara kwa mara wakati mashamba yanalimwa. Usiku, hasa wakati wa mvua wao hutokea na kutembea kwa mashamba wakila wadudu ambao huwashika kwa kuwalenga na ulimi mwenye nguluu. Katika sehemu zingine kama mabonde ya Mwatate na Sagalla hawa vyura ni wengi lakini kwenye sehemu zilizojuu za Taita ni nadra kuwaona.

Hawa chura wana mdomo ambao hutoa ulimi kama risasi (tofauti na chura wengine ambao huchukua

Hemisus marmoratus (kuendelea)

chakula kama kulamba). Ulimi umegawanywa sehemu mbili ambazo huzunguka mchwa ama siafu punde inapoingusa. Huyu chura ana uwezo wa kubadili shabaha kadri mchwa na siafu wanavyotembea haraka. Mapua yake ni madogo, na hawa chura hawawezi kula wadudu wakubwa na kwa hivyo wana uzoefu wa kula mchwa na siafu.

Hawa chura husikika wakati wa misimu yote mbili ya mvua wale wa kiume wa kituoa sauti 'quwark', katika sehemu zilizo karibu na mahali wanapozaliana. Miguu ya hawa chura ni mifupi kwa hivyo wao hujishikilia katika upande wa chura wa kike. Pamoja hutaga mayai kwa kikundi kwa shimo kwa maji yaliyosimama. Viluwiluwi huwa na pezi kubwa ya mkia.



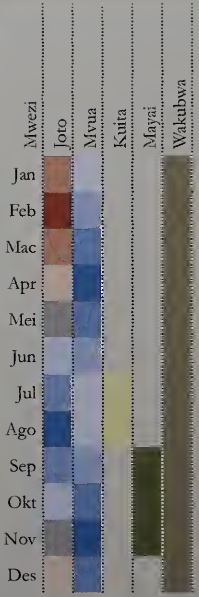
Chura pua nguruwe upatikana wakitembea kwenye sehemu zenye mchanga wa changarawe baada ya mvua kubwa

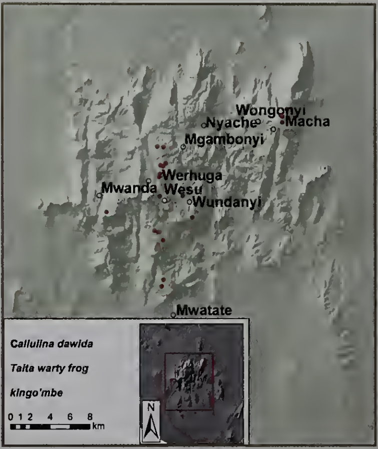
Aina hii ya chura hupatikana kama sehemu kubwa nje ya Milima ya Taita, kuanzi Afrika Kusini mpaka Misri na Afrika Magharibi.

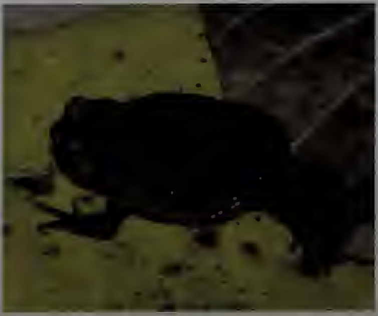
kichula nguwe

Maelezo ya pembeni

Callulina dawida



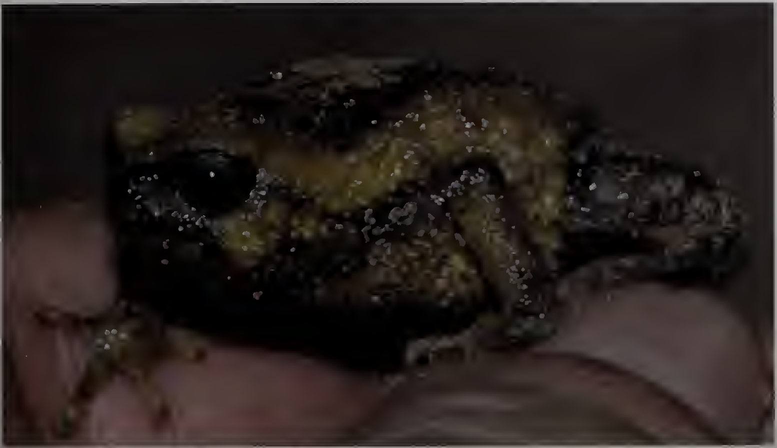




Huyu chura hutembea polepole kwa majani yaliyokauka na ndio jina la kiasri 'King'ombe'.

kingo'mbe

Inakabiliwa na tisho kubwa la kuangamia Hupatikana Taita pekee.

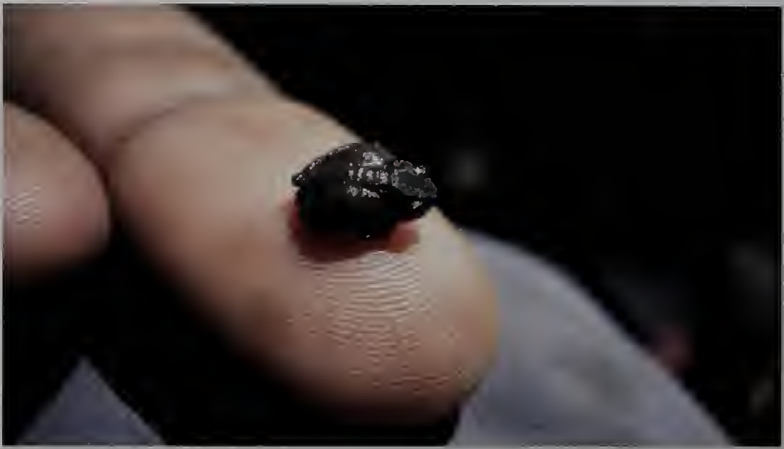


Wanyama wengi wana macho yenye rangi samawati inayong'aa, na mtindo wa ngozi inaweza kuwa hudhurungi/majano ikifanana na majani yaliyokauka kwa msitu.

Ingawa tunajua chura wanaruka, huyu chura huwa anatembea kama ng'ombe juu ya matawi yaliyokauka katika misitu wa kiasili ya Dawida na Mbololo. Wana miguu mifupi na vidole virefu vinavyostahimili ya kupanda miti midogo na mimea inayotambaa. Wakati wa mchana hujificha kwa majani yaliyokauka lakini usiku wao hupanda miti midogo kwa msitu ambapo vyura wa kiume huita kwa sauti yenye milio mitatu 'kru kru krru' Ana ngozi sugu inayotoa maji maji ambayo yana ngruu anaposhikwa. Wanapotishwa hujufurisha mwili kuonekana wakubwa.

Aina hii ya chura hupatikana katika misitu ya kiasili ya Taita. Kwa sababu makaazi yao ni haba na idadi yao ni dogo na iliyotapakaa, huyu chura anatambuliwa kama anayekabiliwa na tisho kubwa la kuangamia. Hii inamaanisha ya kwamba hatua mwafaka zahitajika kuzuia huyu chura kuangamia. Wao hupatikana kwenye mashamba machache yenye

Callulina dawida (kuendelea)



Chura ambaye ameangua ni mdogo akikalia kidole.

miti ya kiasili na hizi sehemu ni za maana ili hawa vyura waweze kutembea kutoka kipande kimoja cha msitu hadi kingine. Kwa kuweka na kulinda vipande hivi vya misitu midogo unaweza kusaidia kulinda hivi chura dhidi ya kuangamia.

Utafiti wetu katika misitu ya Taita umedhihirisha tabia za uzazi zisizo za kawaida. Karibu mayai 40 hutagwa katika tawi kubwa kati ya matawi yaliyo kauka katika misitu ya kiasili kati ya mwezi Agosti na Septemba wakati wa kiangazi. Huyu chura huangua moja kwa moja (ukurasa 10) na kwa hivyo hawana hatua ya viluwiluwi. Chura jike huyalalia haya mayai kuwalinda kutokana na maadui kama wadudu na ndege ambao huwala mayai. Kati ya yale mayai arobaini ni machache pekee ambayo huangua na yale mengine hutengeza mfano wa kiota chenye mvuke kwa yale mayai yatakayo angua ili yasikauke.

Chura jike huyakalia mayai kwa muda wa miezi tatu mpaka yawe karibu kuangua vyura wadogo. Kukaribia mwisho wa kipindi hiki, wakati mvua inaanza kunyesha, chura jike huyala haya mayai tasa, akihakikisha kuwa ako na nguvu ya kutosha kwa kipindi kile anayalalia mayai. Wale chura wadogo wanaoangua (wenye urefu kama milimita 10) katika mwanzo

Alama spesheli inaonekana kana kisaduku cha rangi ya machungwa chini ya ngozi ya chura.

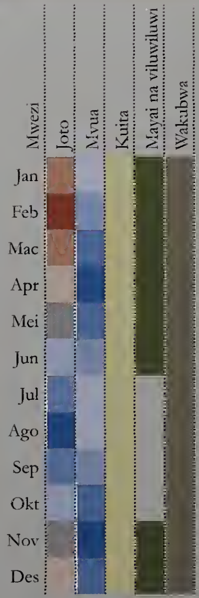
wa Desemba hukua haraka kufikia ukubwa mara mbili katika kipindi cha miezi minne, kwa kula wadudu wadogo kwa majani yaliyokauka. Wanaweza pia kupanda kwa haraka kuepuka maadui wanaowala kama siafu. Baada ya mwaka mwingine wao huwa wamekua karibu kufikia kiwango cha chura amabao wanaweza zaana kwa mara ya kwanza.

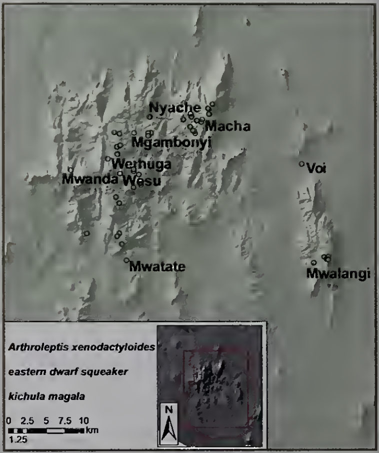
Kuna mambo mengi zaidi ambayo tunahitaji kuyafahamu kuhusu aina hii ya chura ili kuweza kuchangia katika utunzi wake. Zaidi ya vyura mia moja wamewekwa alama na vifaa spesheli (anagalia picha inayofuata) kwenye sehemu za ndani za paja. Ukimuona chura mwenye hii alama tafadhali mjulishe James Mwang'ombe katika Shirika la wanyama pori la Afrika Mashariki.

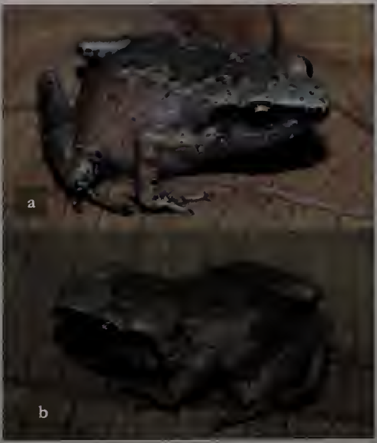
Hawa chura huonekana milima ya Taita pekee nasio mahali pengine duniani kwenye ofisi ya Wundanyi.

Maelezo ya pembeni

Arthroleptis xenodactyloides

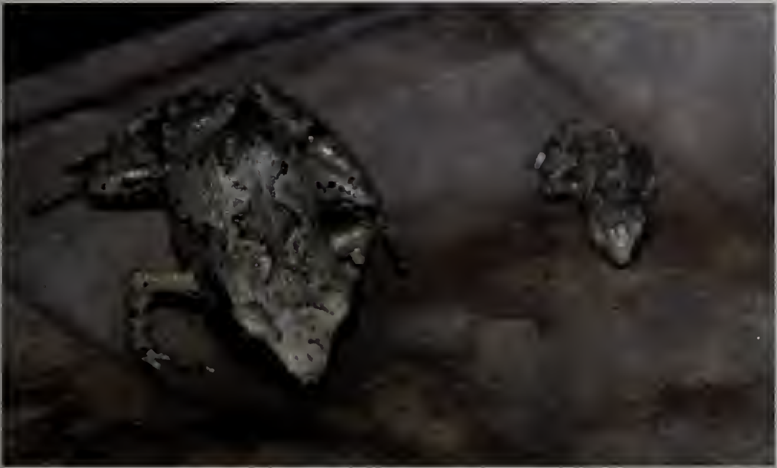






Jike (a) ni wakubwa kuliko dume (b) na huwa wamefura na mayai na huonekana wanono.

kichula magala



Urefu wa chura walionanguliwa ni nusu ya wale wazima, ingawa wazima ni wadogo. Wengi wa chura hawa wana ule mfano wa shisha kwenye mgongo.

Huyu chura ni mashuhuri sana Taita na anaweza patikana kwa msitu wowote ama kwa mashamba. Yeye huishi kwa majani yaliyokauka ambapo hula wadudu wadogo kati ya majani. Wao ni wadogo sana wale wa kike wakifikia ukubwa wa milimita ishirini na tatu na wa kiume kumi na saba pekee ikiwa ni ukubwa wa kidole chako cha gumba. Wana rangi moja na majani yaliyokauka toka hudhurungi hadi nyeusi, haswa wakiwa na mfano wa shisha kwa mgongo. Mwito wa chura wa kiume ni mdogo sana unaofanana na mlio wa chenene ambao unawezasikika ukitoka kwa msitu mwaka mzima, hasa baada ya mvua. Wanapatikana katika vipande tofauti vya msitu na kwa hivyo hupatikana kwa urahisi wakati unatembea kuwaelekea na kuwatazama chini ya miguu yako. Wao ni wakubwa tu kidogo kama chenene na wakiruka hutweka kwa majani.

Wakati wa makwapa, chura wa kiume hujishikilia kwa migongo ya kike na wawili huweka mayai kama 25 katika majani yaliyo kauka. Waume hukaa katika ile sehemu ilikulinda mayai. Huyu chura huangua mayai yake moja kwa moja na kuwa chura

Arthroleptis xenodactyloides (kuendelea)

(ukurasa 10) na kwa hivyo baada ya siku 30 wao huangua na kuwa vyura wadogo, wenye urefu wa milimita tano. Wao hukua na kuwa vyura wazima chini ya muda wa miezi sita.

Utafiti wa kijenetiki unaonyesha kuwa hawa chura huwa wanabebwa na maji wakati wa mvua na wale waliokomaa hubebwa kilomita nyingi toka msitu mmoja hadi mwingine. Kwa mfano chura ambao walishikwa msitu wa Ngangao walipatikana wakiwa na uhusiano wa karibu na wale wa Mbololo.

Kado na Taita hawa chura hupatikana katika sehemu kubwa ya mashariki, kusini na katikati mwa Afrika.

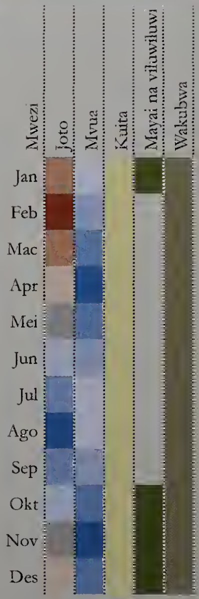
Chura mbilikimo pilimbi wa mashariki huwa na rangi inayofanana na majani yaliokauka.

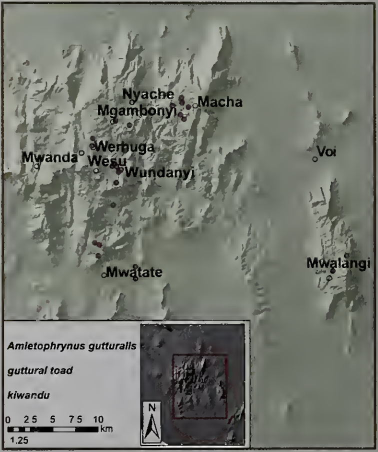
Wao huliwa na ndege, nyoka na wa wadudu. Hapa Taita, hawa chura huliwa na ndege aina ya 'White-starred Robin' ambaye pia huwalisha vifaranga vyake.

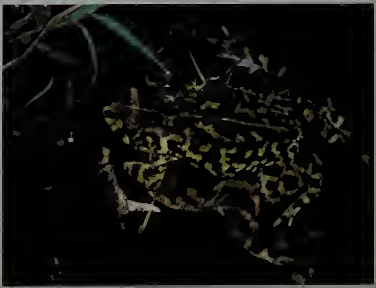
kichula magala

Maelezo ya pembeni

Amietophrynus gutturalis







Todi wawili wakiogelea katika shimo limejaa maji ilikuchagua mahali pa kutagia mayai.

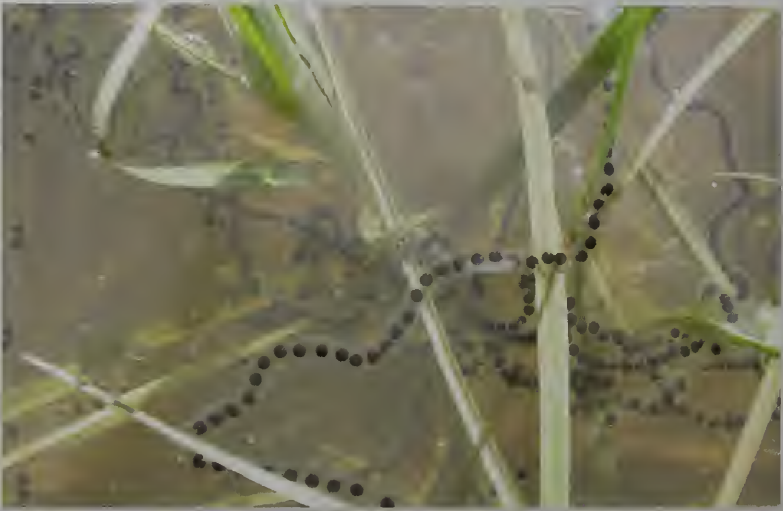
kiwandu

Dume hushikilia jike kwa nguvu ili kutunga mayai.

Huyu ndiye mmoja wa wale chura wanautabulika kwa urahisi na watu wa Taita. Wao hupatika kwa urahisi karibu na boma, mashamba, mashamaba makubwa na pia katika miisho ya misitu. Hii inaelezea jina lake ya Kitaita 'Kiwandu' kama chura wa watu. Huyu todi hupatikana katika sehemu kwanzia kule chini Mwatate hadi kule juu Vuria. Moja ya mambo ya kuvutia ni kutazama huyu mnyama akitokezea usiku karibu na mwangaza kushika wadudu wanaovutiwa na mwangaza. Hawa todi hupata mlo mkubwa usiku ule mchwa wanaruka. Todi wakubwa hula karibu kila kitu kinachotemebea na kinaweza toshea mdomo, ingawa chakula chao ni cha wadudu na konokono. Katika mashamba wao huwa wa faida sana kwani wao hula wadudu ambao huharibu mimea.

Vyura wa kiume huita mwaka mzima ingawa sauti zao huwa nyingi wakati wa mwanzo wa kipindi cha mvua.

Amietophrynus gutturalis (kuendelea)



Mayai yanatagwa mfano wa vijikamba kati ya mimea.

Sauti zao huwa kama kupasuliwa mbao (Rrrrrrrr Rrrrrrrrrr) na milio miingi pamoja husikika kutoka mbali. Todi ndume huita kutoka ndani mwa mahala pa kuzalia, katika vindibwi vya muda au vikubwa. Wale wa kike huvutiwa na milio ya ndume na hushikwa na wale ndume akipita. Chura wengi wa kiume hujaribu kushika jike moja na huwa mviringo wa wanyama. Mayai hutagwa kwa mikufu iliyo na maelfu ya mayai. Viluwiluwi vieusi huangua baada ya wiki moja na hurundikana pamoja. Wao huwa na sumu na hivyo hawawezi liwa na ndege na wanyama lakini huliwa na chura wa makucha na wadudu wa maji.

Baada ya miezi mbili, chura wadogo hutoka kwa maji na kuenda kwa sehemu zinazo zunguka maji. Wanaweza kuwa wengi mpaka wanakaa kama mkeka katika sehemu zingine na ni vingumu kukosa kuwankanyanga. Wengi huliwa na mahasimu hivyo kupunguza idadi katika miezi inayofuata wakati wanasambaa kwenye mazingira. Wakiwa wadogo ni rahisi kuwakanganya na *Arthroleptis xenodactyloides* (ukurasa 24) na

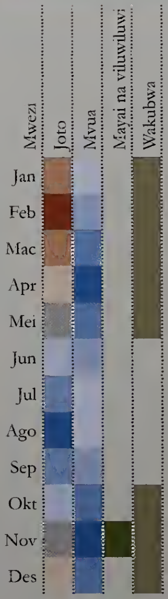
Chura huonekana karibu na nyumba, haswa kama kuna wingi wa chakula.

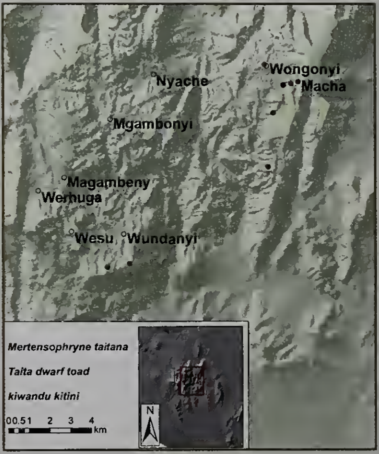
Viluwiluwi wanakaa weusi na wenye miili duara.

Phrynobatrachus cf. *scheffleri* (ukurasa 46). Sehemu za tambalale chini za Tsavo zinazozunguka Milima ya Taita pia huwa todi wawili wanaofanana; na wao ni todi wa Garmani na xeros. Todi wa Guttural hutambuliwa na msalaba wa kipekee kichwani kati ya macho. Huko Mlima Sagalla huyu todi husihi pamoja na todi wa Garmani ambaye uso wake hauna alama. Huyu todi huonekana kutoka milima ya Taita na sehemu zingine zilizoinuka Afrika mashariki kuteremka kusini hadi Durban nchini Afrika Kusini na magharibi hadi Angola.

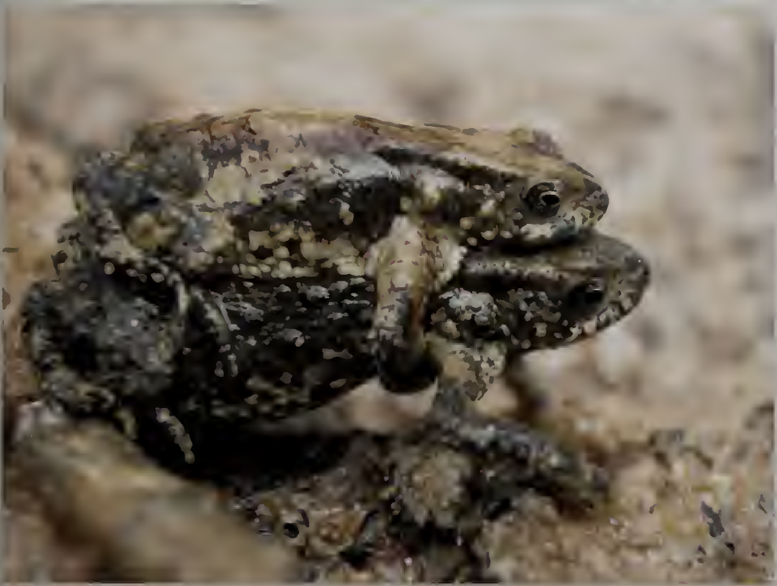
Maelezo ya pembeni

Mertensophryne taitana





kiwandu kitini

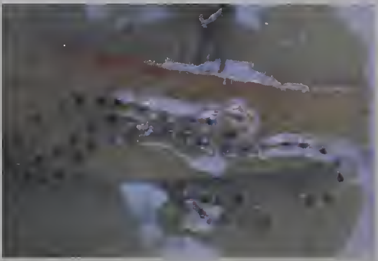


Todi mbirikimo wawili wakielekea kwa kindibwi cha maji barabarani.

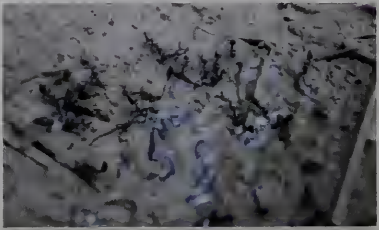
Huyu todi gumba wa Taita alitambuliwa mwanzo na wale waliopatikana huko Mlima Mbololo na Arhtu Loveridge miaka ya 1930, na akaipatia jina *taitana*. Toka wakati huo, huyu chura pia amepatikana katika sehemu za Tanzania, Congo, Zambia na Malawi. Hawa chura ni spesheli juu na tofauti dume huwa haziiti. Katika utafiti hivi majuzi huko Taita ilitambulika kuwa kama wakisumbuliwa wao hutoa sauti ndogo ya hofu (kama chura wengi), lakini hakuna sauti ya kuita iliyosikika. Lakini dume na jike hukusanyika kwa vidimbwi karibu na barabara Novemba, wiki kadhaa baada ya mvua ya vuli. Hawa chura wadogo (kimo cha milimita 25 hadi 35) na hukusanyika kila siku na mayai yakitagwa kwa kamba ndefu (kama mayai 300 kwa kila kamba).

Hawa viluwiluwi hunagua kutoka mayai haraka sana na kujifukia kwa

Mertensophryne taitana (kuendelea)



Kamba za mayai zikitagwa kwa maji ambapo huangua na kuwa vyura wadogo baada ya wiki mbili.

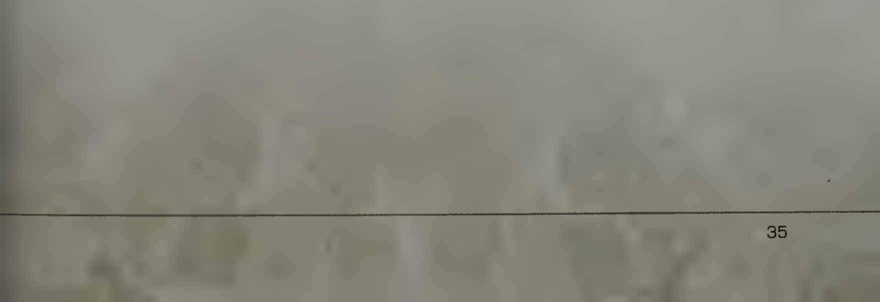


Vindimbwi kado ya barabara hukauka vikiacha viluwiluwi ambao huwa mlo wa wanyama wengine kama siafu.

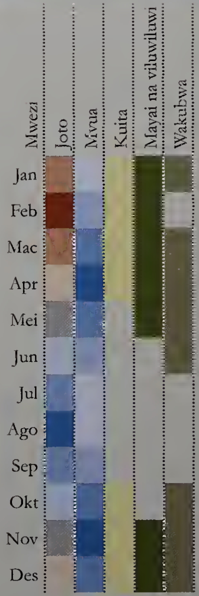
matope kado ya kidimbwi ili kuia. Kila mmoja ako na kiungo spesheli juu ya kichwa ambayo husaidia kupumua juu ya upungufu wa hewa ya oksijeni. Hawa viluwiluwi hubadilika baada ya muda kama wiki mbili ambao ndio muda mfupi unaojulikana kwa chura yeyote. Baada ya ngono hawa todi hutoweka na kuonekana tena wakati wa kuzaana, Novemba. Baadhi ya hawa wanyama wamepatikana kwa mashamba ingawa ni mambo machache yanayo julikana kuwahusu mbali na mambo ya kuzaana. Wale wazima wako na tabia ya ajabu kutembea kwa miisho ya makucha na haijulikani kwa nini!

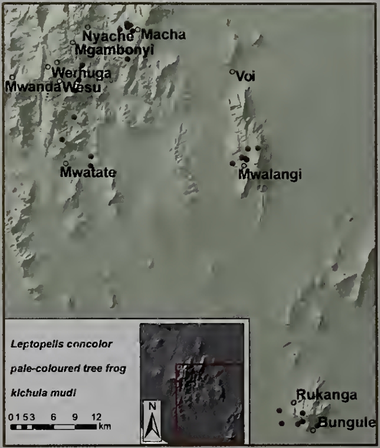
Wengi wa hawa chura wamepatikana Mbololo, na kuzaana kumeonekana kwa vindibwi barabarani. Kado na Mbololo hawa chura wamepatikana eneo la Macha, na hawapatikani kwa sehemu nyingi Taita.

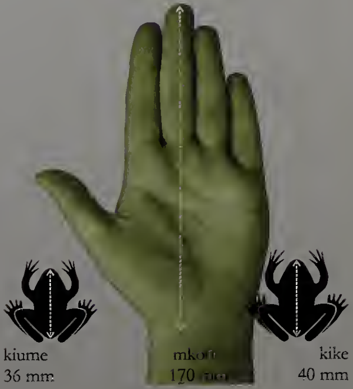
Maelezo ya pembeni

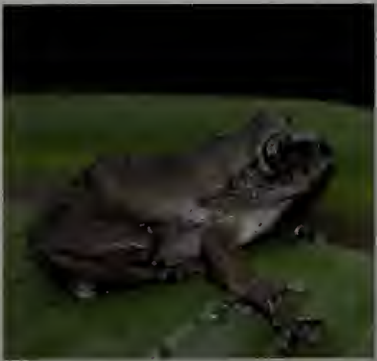


Leptopelis concolor



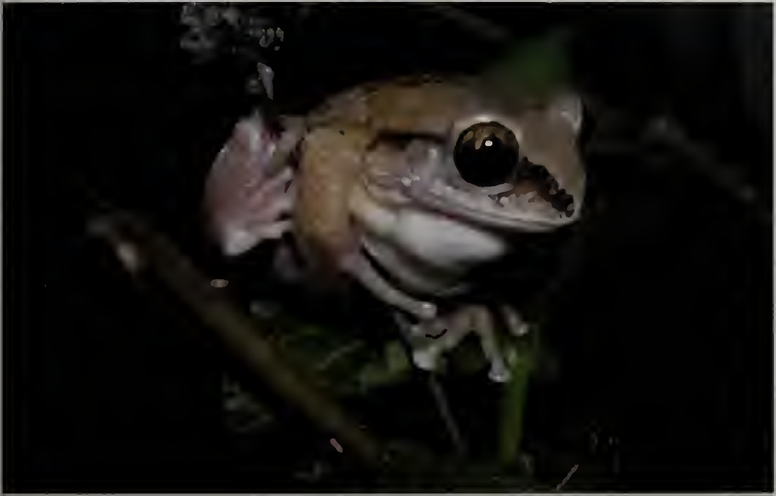






Macho makubwa yanaonekana kwa mwangaza mdogo na vidole vipana vinavyosaidia kushikilia majani.

kichula mudi



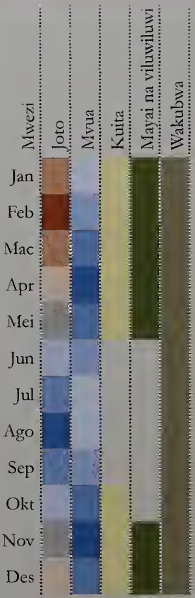
Chura wa kiume ukaa juu ya mimea usiku na kutoa sauti ya kipekee.

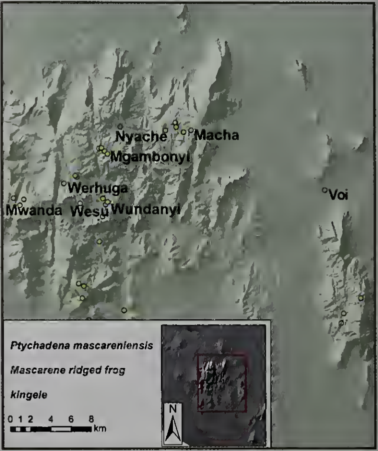
Huyu chura anajulikana kutoka sehemu za chini za Taita. Ni kawaida kuona huyu churamiti mwenye rangi iliokwajuka kwa mashamba yenye maji. Yeye huketi kwa miti katika urefu kama mita moja na nusu juu, na dume huita kwanzia Oktoba hadi Aprili usiku vuguvugu, na wenye unyevu. Mwito wake unasehemu mbili; mwanzo ni sauti kubwa 'quack' ikifuatiwa na miunzi tatu inayodididimia. Mayai yanatagwa nje lakini karibu na maji, haswa juu ya mimea. Viluwiluwi wadogo kanza hukua ndani ya mayai na kuangua moja kwa moja ndani ya maji kama viluwiluwi wanao ogelea.

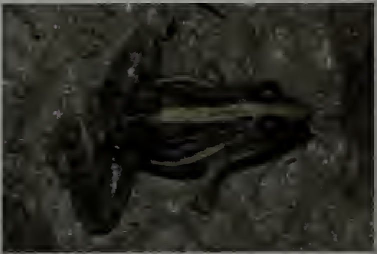
Wale wazima wana rangi ya hudhulungi na mfano wa shisha kwa mgongo (kama kichula magala). Wana macho makubwa yaliyokodolewa na kuonekana kwa kichwa. Wanayatumia kutafuta chakula katika mwangaza mdogo wa asubuhi na jioni.

Ingawa hawa chura wanafanana na churamiti wa glandikola (k.m. vidole vilivyo pana na vile wanaketi), wao hawana uhusiano. Huyu chura mwenye rangi iliyokwajuka ako kwa kundi moja na kichula magala.

Ptychadena mascareniensis

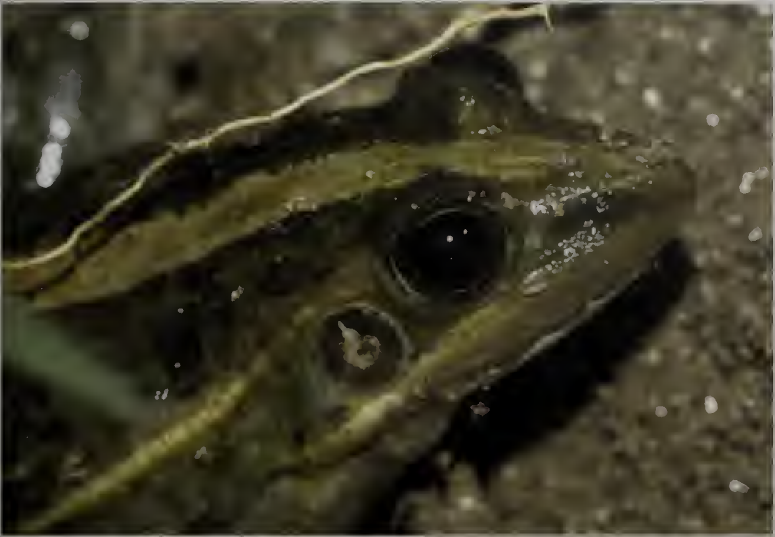






Chura wenye mikuja wanaweza patikana kwenye mitaro ya kunyunyizia maji mashamba na huruka ndani ya maji wakisumbuliwa.

kingele

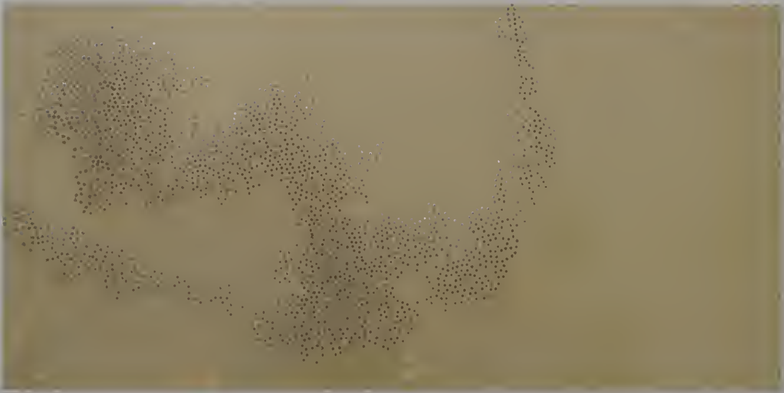


Chura kigongo kiume ana mitungi ya masikio kubwa nyuma ya macho. Chini ya masikio iko mkato ambapo vifuko vya sauti hutokea wakati wa kuita.

Ingawa huyu chura ni mashuhuri yeye huonekana tu muda anaporuka toka kwa majani na kuingia majini na kuogelea mbali. Ukishika moja utaona yuko na mgongo ulio na mikujo na hivyo jina la hawa chura. Mchana hawa chura huwida katika miisho ya vindimbwi au mito yenye mwendo usio wa kasi, wakitafuta wadudu wadogo wa kula wanaoshikwa kwa kulamba na ulimi. Wakisumbuliwa, wao huruka mbele kuelekea ndani ya maji (kama yako karibu). Wao ni mahiri kwa kuruka na wanaweza kuruka mita kadhaa kwa kuruka mara moja.

Chura hawa huzaana Taita mwaka wote isipokuwa miezi kavu ya Juni hadi Septemba. Dume zina vifuko vya sauti ambavyo hufura kwa pande zote za kichwa na kutoa sauti ‘chrrr chrrr chrrr’ inayoweza sikika kwa mbali. Jike hutaga mayai ambayo huelea juu ya maji na kunagua na kuwa viluwiluwi vinavyo patikana hata kwa maji kado ya barabara.

Ptychadena mascareniensis (kuendelea)



Mayai yaonekana yakielea kwa muda wa wiki moja kabla ya viluwiluwi kuangua na kuingia majini.

Hawa viluwiluwi huchukua miezi miwili kuwa chura wadogo ambao huchukua miezi tisa kukomaa.

Huyu chura ni rafiki wa wakulima juu wao huwa wengi na hula wadudu waharibifu katika shamba. Yeye hufana na chura wa mikujo wa Anchieta (ukurasa 42) lakini hutofautiana na wa Taita kwa kuwa na mstari mweupe (rangi malai, kijani au hudhurungi) kwa mgongo hadi kwa kilele cha mapua. Dume ni wadogo kuliko jike na zaweza tambuliwa kwa chanja kwa pande zote mbili za kichwa mahali vifuko vya sauti huwekwa.

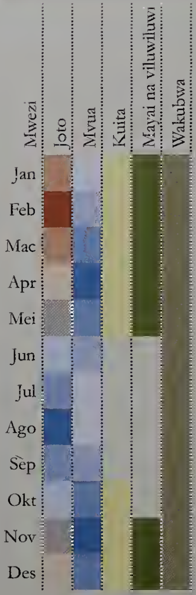
Hawa chura hupatikana kwa sehemu kubwa nje ya Taita kwa sehemu nyingi za kati na kusini mwa Afrika. Walakini, utafiti wa kijenetiki unaonyesha ni kikundi cha mkusanyiko wa vyura wengi na kwa hivyo jina laweza badilika

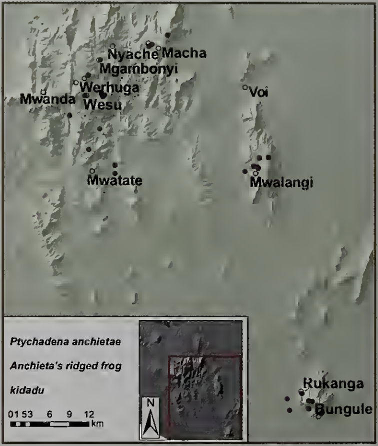
Viluwiluwi wa chura kigongo ukua miguu ya nyuma kwanza na upatikana kwa aina nyingi ya rangi.

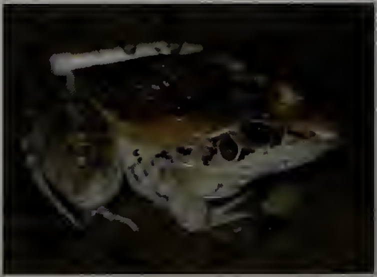
baadaye. Hupatikana pia kwa visiwa vya Bahari Hindi na Madagascar. Hata kama huyu chura ameletwa na binadamu kwa hivi visiwa (hata Visiwa vya Mascarene pale alipotambuliwa kwanza) alifika kwa vingine kwa mimea iliyosombwa na mafuriko.

Maelezo ya pembeni

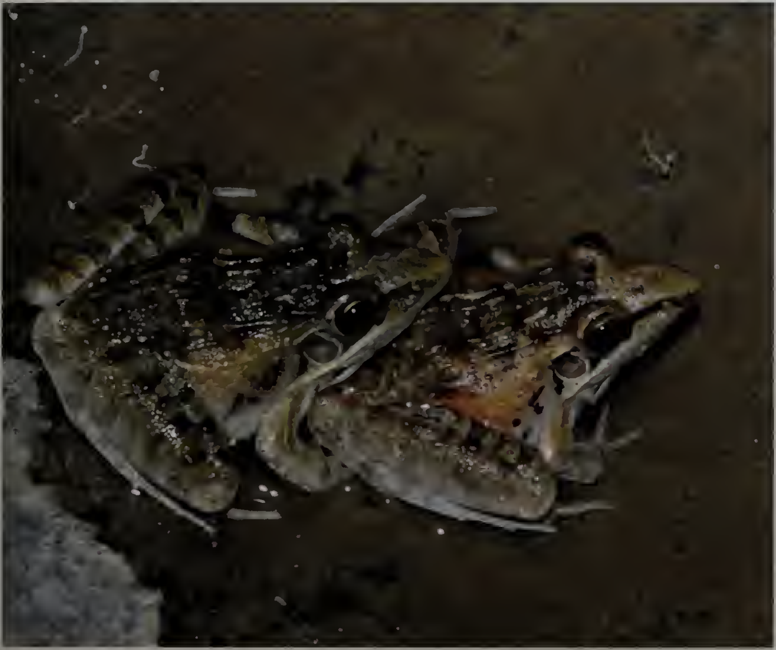
Ptychadena anchietae







Chura wa mikujo wa Anchieta wana umbo la miramba mitatu kati ya macho likipita hadi kwa mapua.

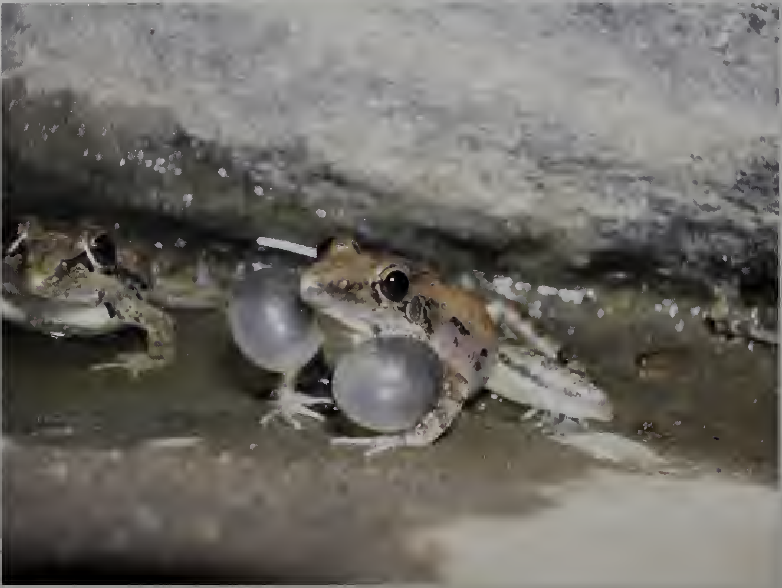


Chura kigongo wa Anchieta wanaweza patikana wakiwa wameketi pamoja pembeni ma maji usiku.

Huyu chura anakaa mahali sawa na chura wa Mascarene (ukurasa 38). Ingawa, huyu chura hupendelea kuishi kwa sehemu zilizo chini na yule wa Mascarene hupatikana kwa wingi huko milimani. Huyu chura hupenda kuruka na ataruka punde anaposumbuliwa. Kama hawezifika kwa maji kwa kuruka mara ya kwanza huruka tena ama kujificha chini kabisa kwa nyasi na kupitia katikati ya majani na kufanya kuwa vingumu kumshika.

Huyu chura anazaana wakakati wowote isipokuwa miezi iliyokauka (Juni hadi Septemba) na kwenye sehemu sawa na chura wa Mascarene; kwa vindibwi, na maji iliyosimama kado ya barabara. Wanatoa sauti kwa vifuko vya

Ptychadena anchietae (kuendelea)



Dume ziko na vifuko viwili za sauti zinozotokeza kwa chanja zilizo pande mbili za kichwa.

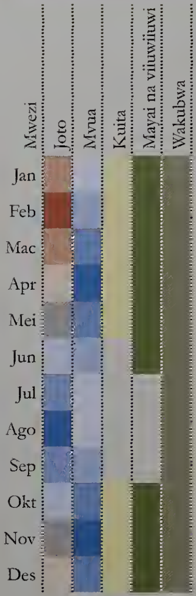
sauti kwa kila pande ya kichwa. Ile sauti inayotoka ni tofauti na inawezatabulika kwa kuwa ni kama 'wah wah wah'.

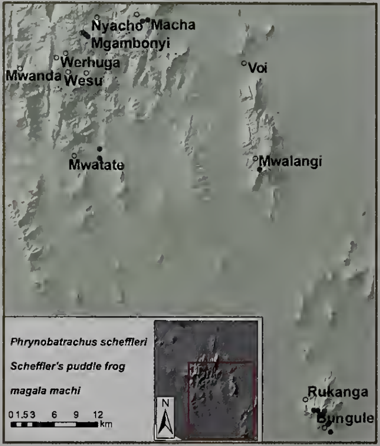
Huyu chura ameenea kwa Africa Mashariki, na wale wazima waweza tambuliwa kutoka kwa chura kigongo wa Mascarene kwa umbo la miraba mitatu kati ya macho hadi mapua. Huyu chura ni rafiki ya wakulima wa Taita juu hula wadudu wanao harribu mimea.

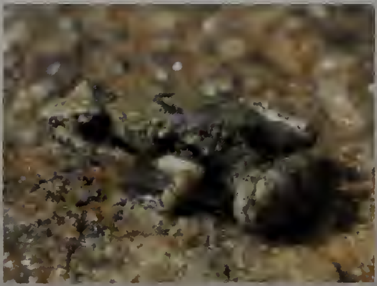
Vijiluwiluwi wa chura kigongo ukua dani ya mfuko maji ambao uelea majini.

Maelezo ya pembeni

Phrynobatrachus scheffleri

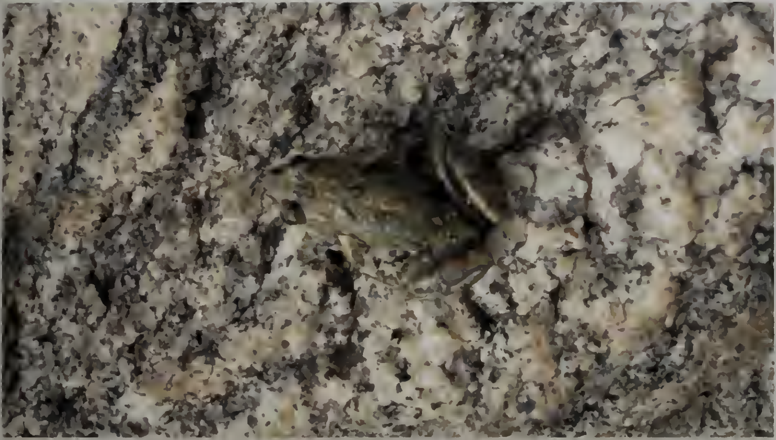






Chura mbilikimo wa Scheffler ni mdogo sana na hupitakana kado ya vijito mahali penye kivuli.

magala machi



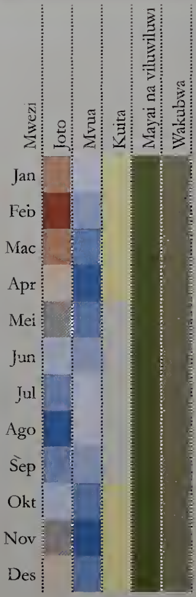
Chura mbilikimo wa Scheffler ana matundu mawili yanayokaa herufi V kwa mgongo.

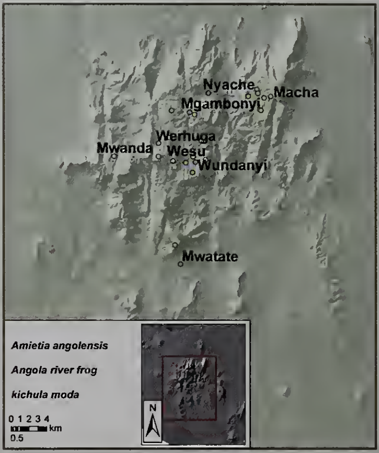
Hawa ni baadhi ya chura wadogo wanaopatikana Taita, wale wakubwa wana urefu wa milimita 22. Wanaweza patikana rahisi karibu na vijito na maji yanayododoka kwa nyasi, miti na misitu. Wao huruka haraka kwa matope au mchanga kando ya vijito wakishika inzi na wadudu wengine wanaotua hapo. Huyu chura anaweza kanganywa na yule wa *Arthroleptis xenodactyloides* (ukurasa 24), mbali na kuwa na alama ya msalaba mgongoni.

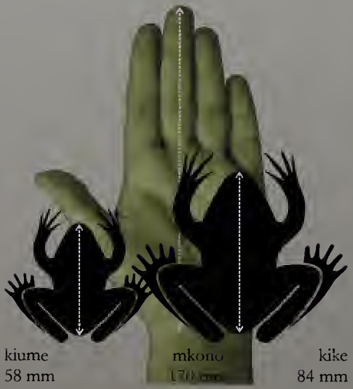
Dume huita kwenye sehemu zilizo jificha karibu na mahali wanapozaana na hutoa milio mifupi mifupi 'bzz bzz bzz'. Huyu chura hutaga mayai yameachana moja moja na huelea kwa vindimbwi kando ya vijito hasa vile vinavyotokea wakati wa mvua. Viluwiluwi hukua kwa hivi vindimbwi vidogo na kubadilika kuwa wadogo wanaoweza patikana kando mwa kijito.

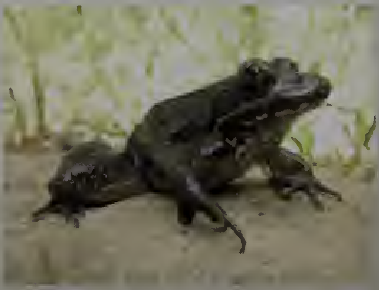
Huyu chura hupatikana haswaa Afrika mashariki na kusini, lakini kunaaminika kuwa wanaweza kuwa wengi zaidi kado wanaotambuliwa.

Amietia angolensis



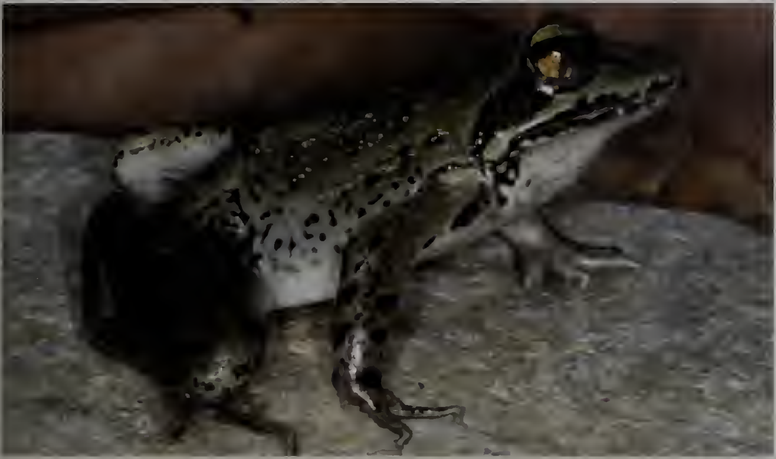






Dume zawezapatikana zimekaa kando ya mito kwenye sehemu zinazoonekana.

kichula moda



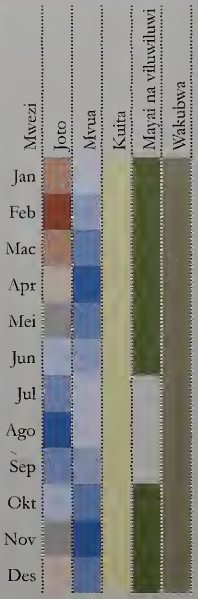
Hawa ni vyura wanene walio na miguu ya nyuma yenye nguvu ya kuogelea dhidi ya mkondo wa maji.

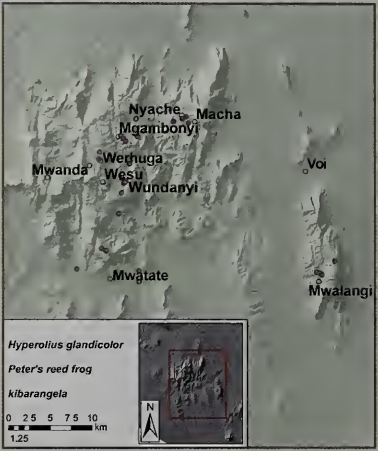
Huyu ni chura mkubwa sana (hadi urefu wa milimita 90) na anawezapatikana kando kando ya vijito na mito mikubwa. Waliokomaa hupatika kwa fuo za mito mwaka wote. Waume huita wakati wa mvua kwa misururu ya sauti ndogo ikifuatiwa na sauti kubwa wakiwa sehemu zilizojificha chini ya fuo za mito ama wakielea majini. Wakisumbuliwa wao huruka haraka majini na wao ni waogeleaji mahiri wanao matuta ya kuogelea kwa miguu. Rangi yao ya hudhulungi na kijani huoana vizuri na matope na mimea.

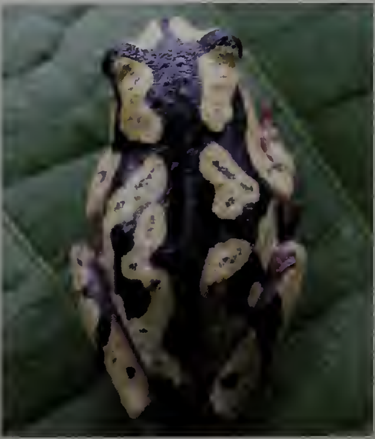
Chura wawili hutaga yai moja moja kwenye vijito vinavyo tiririka polepole kwanzia Oktoba hadi Aprili. Viluwiluwi wanaishi kwenye sehemu zile zile lakina wanaweza enda juu ama chini ya vijito ili kusambaa. Kwenye milima ya Taita wanaweza chukua hadi miaka miwili kabla ya kukomaa, wao hukua na kuwa na urefu mkubwa (hadi urefu wa milimita 60). Ukipata viluwiluwi mkubwa kwa maji yaliyotulia kwa mito ya Taita, bila shaka ni huyu chura.

Huku Taita, waliokomaa wanaweza patikana kwa vijito na mito. Viluwiluwi hupatikana kwa vijito vyenye maji yanayo tiririka polepole na pia mambomba ya miradi ya maji.

Hyperolius glandicolor

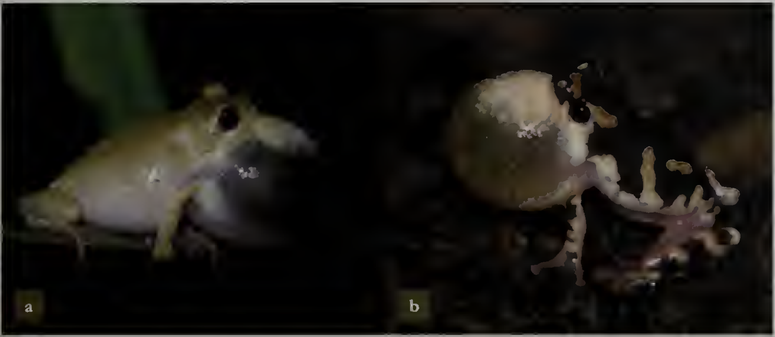






Chura miti kike ikionyesha rangi nyeusi na manjano ya kawaida.

kibarangela

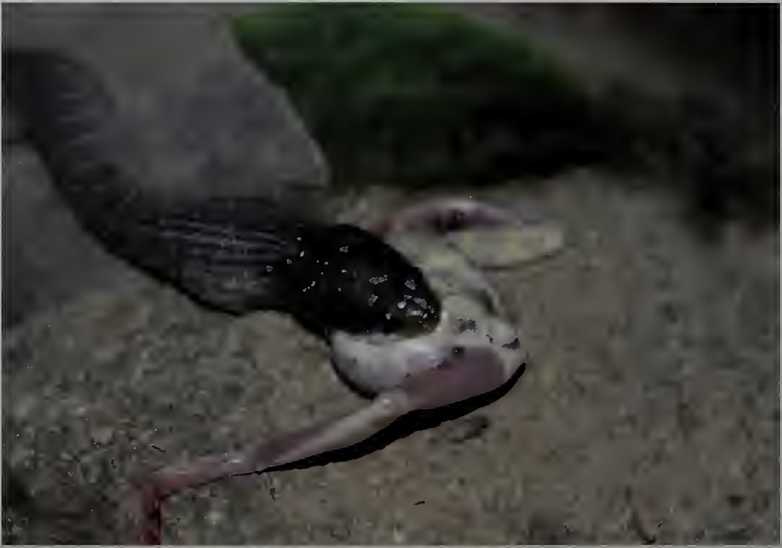


Dume huwa na kifuko kikubwa ambacho hufurishwa wa kiita. Wako na mitindo miwili tofauti ya rangi, ya hudhurungi (a), na mchanganyiko wa madoa meusi na majano inayofana na kike (b).

Churamiti huyu ndiye pengine amfibia yule anayefahamika zaidi Taita. Yeye huishi kwenye vindibwi vya muda au vya kudumu vipatikanavyo haswa kwenye nyasi na mimea mingine inayokua karibu na maji. Walakini chura waliokomaa na wadogo pia hupatikana ndani ya msitu au mashambani bali na maji. Wakati wa mchana hawa chura wanaweza kustahimili joto ya jua kwa kuketi na miguu yao ikiwa karibu na mwili kupunguza kupoteza maji kutoka kwa mwili na hata saa zingine hubadili rangi ili kupunguza adhali ya joto. Wakati wa jioni au baada ya mvua hawa chura hutokea na wale wa kiume hukaa juu ya nyasi na mimea iliyo karibu na maji na kupanua kifuko cha sauti na kutoa mlio 'bwoep' kwa pamoja. Wakati waume wengi wanapoimba pamoja sauti yao huwa ina weza kufunga masikio ya binadamu. Chura wa kiume wana mitindo miwili ya rangi, moja ya kawaida ya hudhurungi na nyeusi ikiwa na madoa ya majano, ambao ni mtindo wa vyura wa kike. Vyura wa kiume hulinda makaazi yao na wakati ndume mwingine akipita wao hutoa sauti 'croak' kuonya ushindani.

Huyu churamiti huzaana katika misimu yote miwili ya mvua na wanaume husikika wakiita mwaka wote haswa baada ya mvua. Chura wa kike hupatikana sehemu zinazozunguka hadi wawe tayari kwa ngono. Wao huenda karibu na kuchagua kati ya chura wa kiume wanaoita.Wao hushikana wawili katika ngono na hutaga mayai kwa

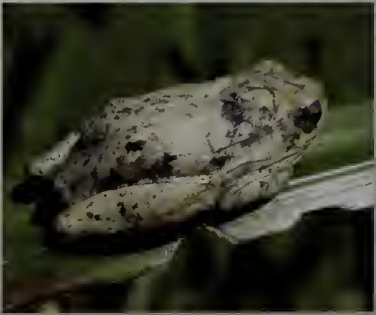
Hyperolius glandicolor (kuendelea)



Hawa chura wanaliwa na aina nyingi ya wanyama kama wadudu, buibui, ndege na vile vile nyoka kama aliye kwa picha.

vikundi juu ya majani yaliyoelea majini. Mayai hunagua nje ya maji na viluwiluwi kuanguka dani ya maji. Viluwiluwi huendelea kukua kwa wiki kadhaa halafu vijichura hutoka kwa maji kuendelea kukua katika sehemu zilizo karibu.

Hizi chura ni tofauti kwa ajili ya rangi zao na ngozi laini inayong'aa na umbo kama plastiki. Vidole vya mikono na miguu huwa na matuta ambayo huwasaidia hawa wanyama kujishikilia na kupanda kwa majani

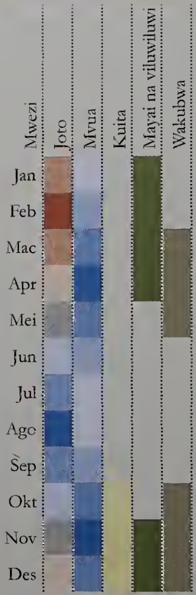


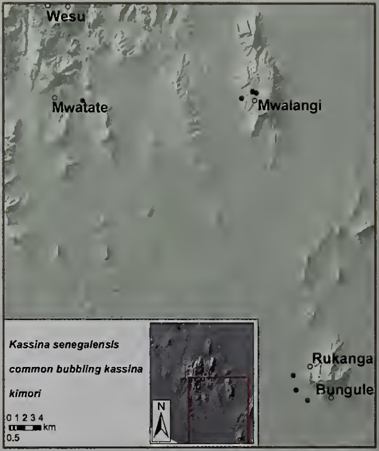
Ngozi yake inaweza kuwa kavu na wanyama wanaweza kuvumilia jua kali.

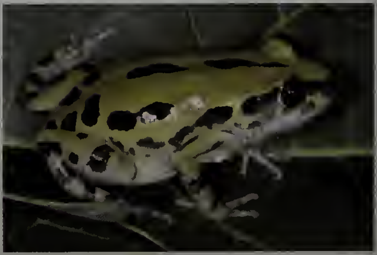
na nyasi. Ndani ya miguu na mwisho wa kucha huwa na rangi nyekundu nyeupe (waridi) au nyekundu. Huyu chura anaweza kanganyishwa na *Leptopelis concolor* (ukurasa 36) na *Chiromantis petersii* (ukurasa 56). Walakini yeye ni chura mdogo kuliko hawa wawili na yeye ndiye tu ambaye kike wake wana rangi nyeusi na majano na huwa na jicho lenye boni anayetoka kushoto hadi kulia mwenye mfano wa almasi. Huyu chura hupatikana nje ya milima ya Taita, lakini huwa wanafanana na chura wengine ambao wamepangwa katika kundi moja.

Maelezo ya pembeni

Kassina senegalensis

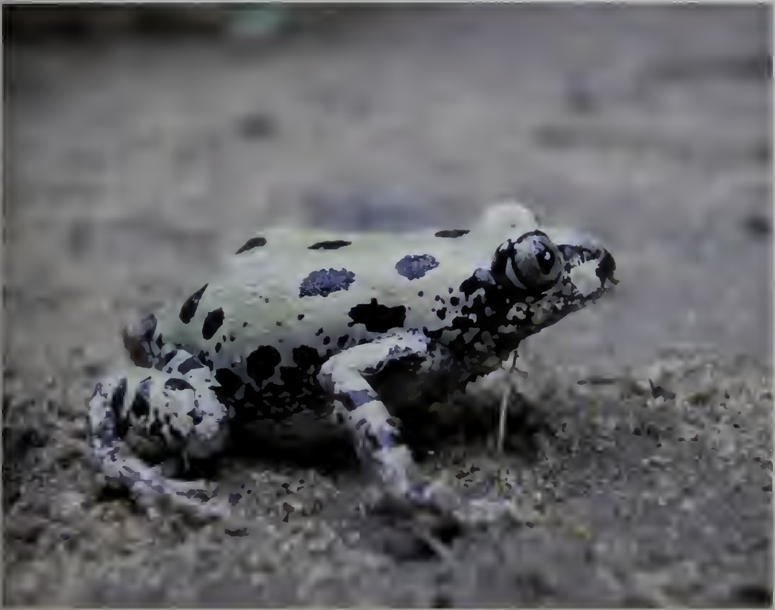






Alama nyeusi kwenye kimori wa kiputo huwa tofauti kutoka mishoro hadi madoadoa.

kimori

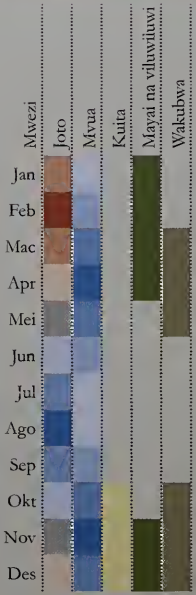


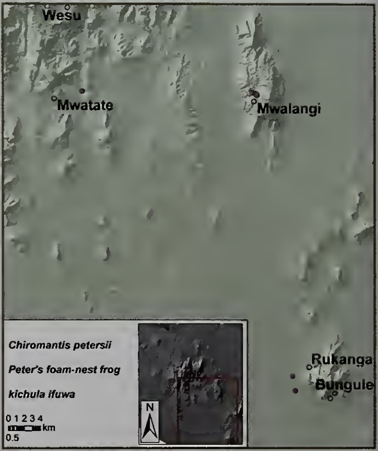
Hawa chura ni ngumu kuwapata nje kwani hujificha kwa mimea kado ya maji.

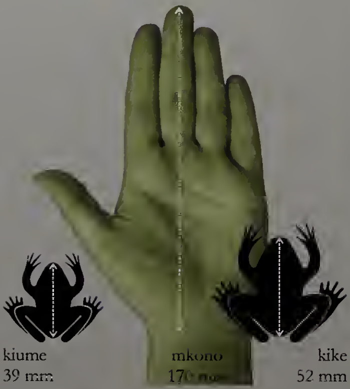
Huyu ni chura mwenye umbo la kipekee, wana rangi ya kijani, na saa zingine inakaa dhahabu imefunikwa na madoa meusi yaliyozungukwa na upete mweupe. Huku Taita, dume huita katika misimu yote ya mvua, Machi na Novemba. Dume huita kwa maji maanga katika mabomba na vinamasi zikijificha chini ya mimea. Sauti yao ni kama mifululizo ya viputo vitokao majini na ndio jina kassina wa kiputo. Mayai hutagwa katika sehemu zilezile dume huita kwa vikundo. Viluwiluwi ni tofauti na huwa na pezi refu.

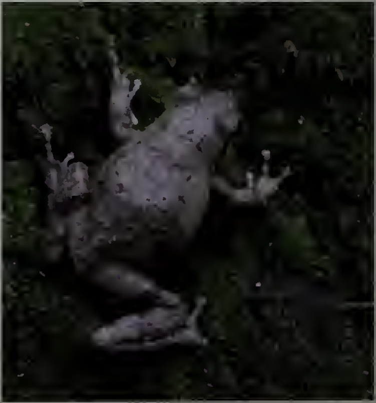
Huku milima ya Taita, hawa chura hupatikana sehemu za chini, pamoja na mlima Sagalla. Imeenea katika sehemu zilizo chini ya Sahara, mahali mitindo ya rangi yaweza tofautiana; madoa (huku milima Taita) na milia (kwingineko) ikiteremka kwa mgongo.

Chiromantis petersii



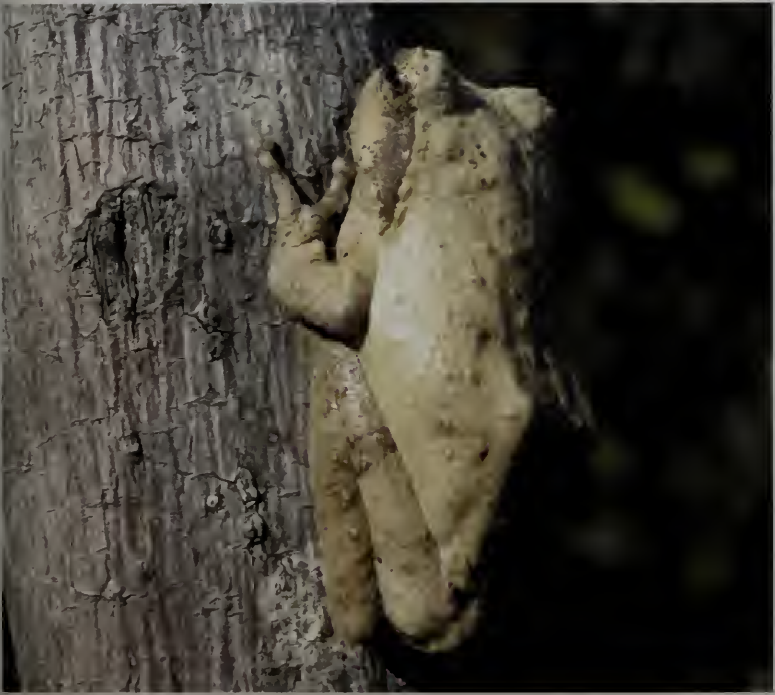






Hawa chura wana miguu ya kipekee na vidole vinavyoweza kushika matawi ya miti.

kichula ifuwa



Unaweza pata hawa vyura wamekaa kwenye jua mchana ambapo huonekana weupe.

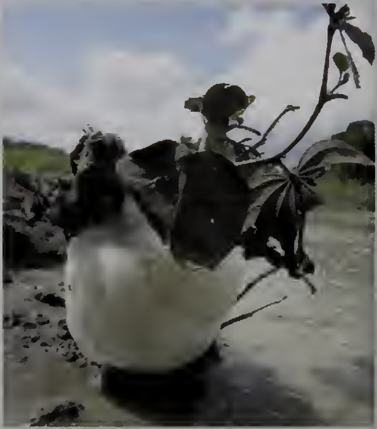
Huyu chura huishi haswaa kwa sehemu za chini kuzunguka milima ya Taita, na Afrika mashariki mzima ingawa hawa wanyama wanweza patikana Sagalla kwa mita 1 000 toka ufuo wa bahari. Inaweza patikana kwa mambomba, vindimbwi na vinamasi ambapo dume huita kwa mafunjo na vichaka. Mlio huwa wa kipekee 'chirp' ukifuatiwa na mfululizo wa sauti.

Wakati dume na jike wako ngono, jike hutoa ute unaoshikana ambao hufanywa pofu kwa kitumia miguu yao ya nyuma. Pofu lakutosha huchanganywa kutengeneza kiota kiasi cha mpira wa miguu kikininginia

Chiromantis petersii (kuendelea)

kwa maji. Wawili hutaga mayai katikati mwa hicho kiota cha pofu na baadaye kinakauka na kuwa kigumu nje lakini ndani kina unyevu. Hii huzuia mayai kukauka juani; ilihali kuoja vibaya kwake huzuia kuliwa na wanyama. Mayai yakiangua, viluwiluwi huanguka moja kwa moja ndani ya maji na kuanza kula na kukua.

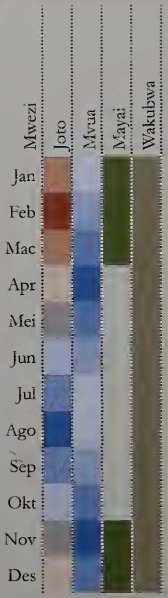
Huyu chura akipatikana wakati jua imewaka huwa amebadiri rangi na kuwa mweupe na ni vingumu kukanganya na wengine. Miguu ina vidole vilivyogawanyika mara mbili na miduara kama churamiti, lakini wakubwa na boli ya jicho limelala. Ngozi hukaa sugu na yenye matuta.

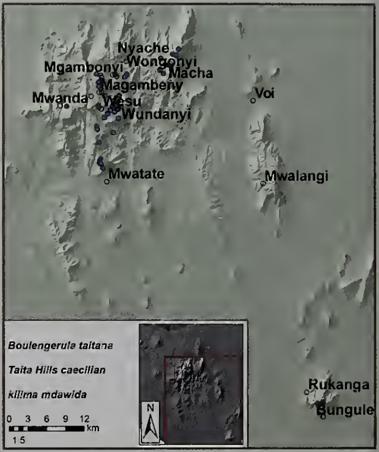


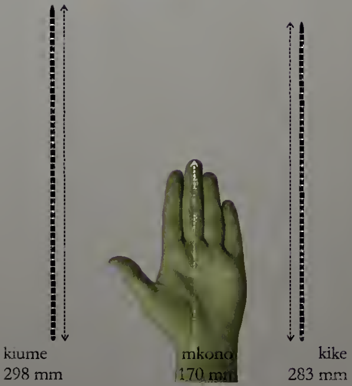
Mfano wa kiota cha pofu wa kikiwa kado ya kindimbwi kikubwa.

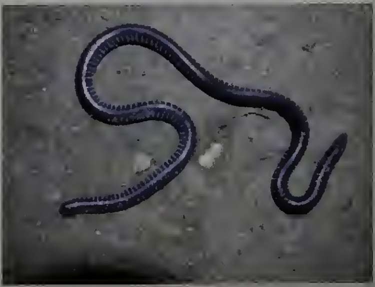
Maelezo ya pembeni

Boulengerula taitana







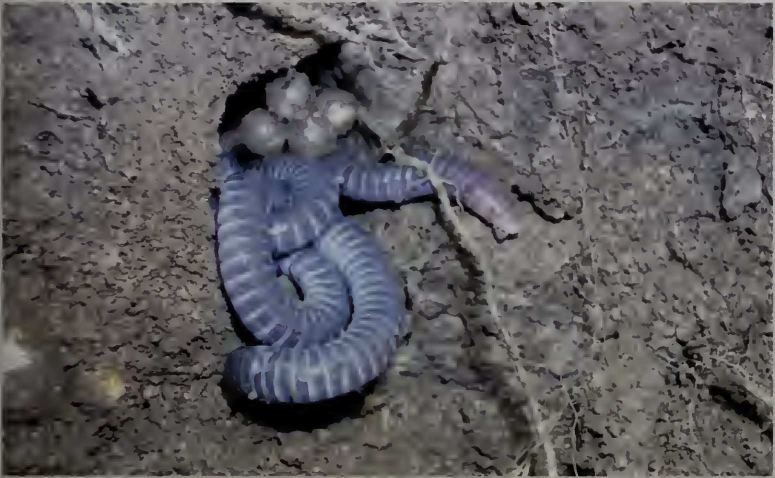


Cicilia wa Taita aliyekomaa hukaa amepotea akiwa sakafuni; kwani kwa kawaida huishi ndani ya mchanga ambapo hutembea kwenye mitaro ya chini ya ardhi.

kilima mdawida

Inaweza kudhuriwa

Hupatikana Taita pekee.

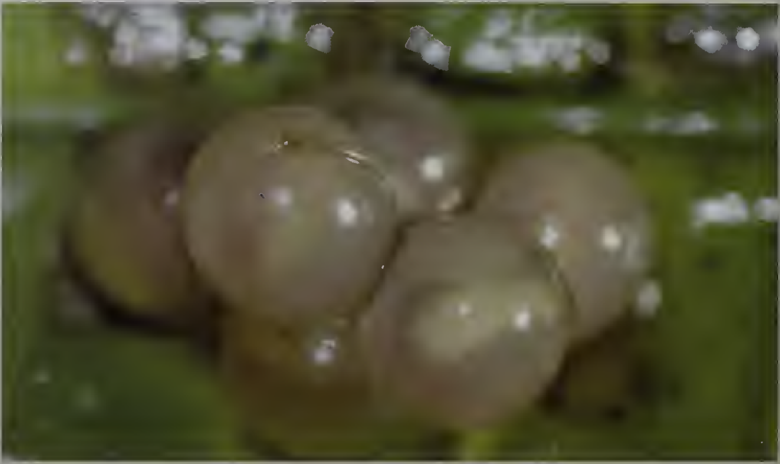


Jike la cicilia wa Taita likilalia mayai shimoni.

Huyu amfibia hukanganya watu na kuitwa mng'ori lakini yeye ni amfibia mwingine (kikundi cha Gymnophiona—ukurasa 8). Yeye hupatikana milima ya Taita pekee (Dawida, Mbololo na Kasigau), juu ya mita 1 000 toka ufuo wa bahari. Yeye huishi kwenye mchanga mweusi na wenye rutuba kama mng'ori juu hiki ni chakula chake pamoja na mchwa. Wao hupatikana kwa wingi kwa baadhi ya mashamba, haswa mahali ndizi humea ingawa pia hupatikana kwa misitu ya kiasili hata kwa misitu yakingeni ambapo mchanga una unyevu wa kutosha. Hawa wanyama hutegemea unyevu kwenye mchanga na hivyo hawapatikani chini ya milima ama kwa sehemu zilizo kwenye uvuli wa mvua (ukurasa 4).

Huyu ni amfibia anaye angua moja kwa moja (ukurasa 10), hutaga mayai kwa vyumba vidogo ambavyo hulindwa na jike na kugeuzwa mpaka waangue. Mara wanapoangua wale wadogo wenye rangi ya waridi huwa

Boulengerula taitana (kuendelea)



Mayai ya hawa viumbe huwa yameunganishwa na kijikamba. Wadogo wanao angua moja kwa moja wanaonekana wamejikuja ndani wakizunguka kiiniyai cha majano.

na meno spesheli na hutumika kula ngozi kutoka mgongo wa mama. Hii ngozi ni lishe bora ili wale wadogo waweze kukua haraka. Wakati wale wadogo watakuwa tayari kujifukia kwa mchanga huwa na rangi nyeusi na samwati ya huyu cicilia.

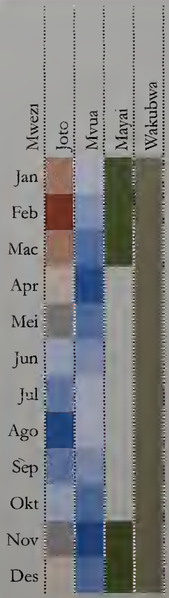
Kuwa na hawa cicilia kwa shamba lako huonyesha mchanga wako uko na rutuba. Wao ni marafiki wa wakulima na hula aina kadhaa za wadudu waharibifu ambao hushambulia mizizi ya mimea. Fuvu la huyu cicilia halina mashimo ya macho amabayo huwa madogo sana pengine ya kutofautisha mwanga na giza. Waliokomaa wana mistari mitatu ya meno (ingawa hawaumi watu) wanatumia kushikia chakula. Ingawa wale wazima wako karibu vipofu, wanaweza kupima ukubwa wa mulo na kutambua nguvu zinazohitajika kuigeuza.

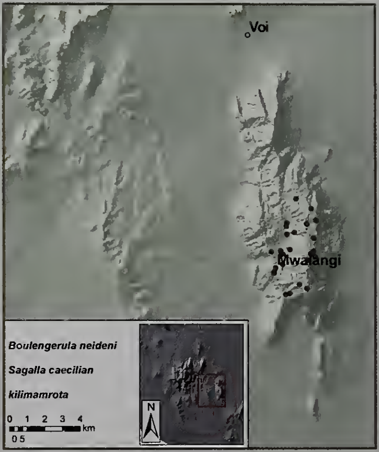
Huyu kiumbe hupatikana milima ya Taita pekee (ukurasa 3) imeorodheshwa kama inayokabiliwa na tishio la kuangamia. Unaweza saidia kutunza hawa wanyama kwa kuzuia mmomonyoko wa udongo na kuhakikisha ya kwamba hunyunyizi madawa ya kuuwa wadudu na kwekwe.

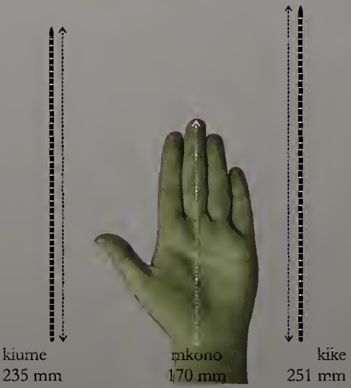
kilima mdawida

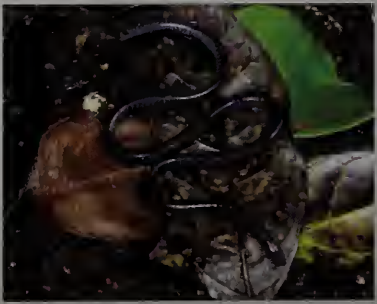
Maelezo ya pembeni

Boulengerula niedeni





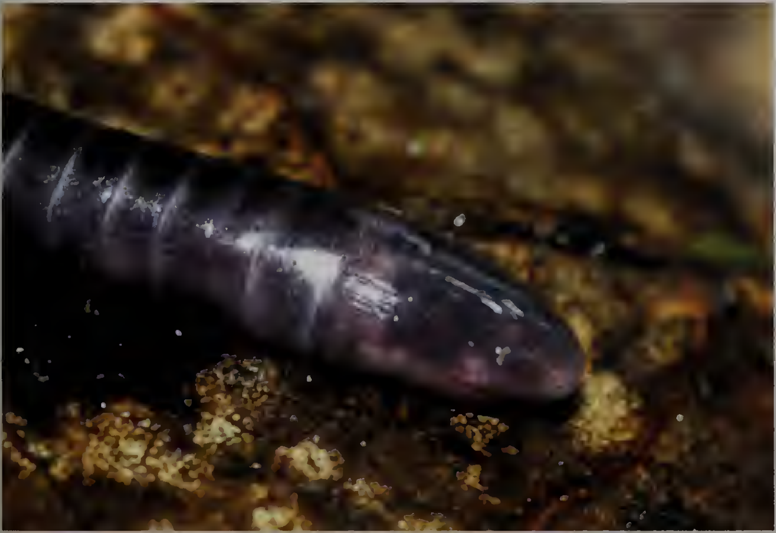




Cicilia wa Sagalla anaweza patikana mara kwa mara juu ya mchanga akitorokea siafu.

kilima mrota

Inakabiliwa na tisho kubwa la kuangamia **Hupatikana Taita pekee.**

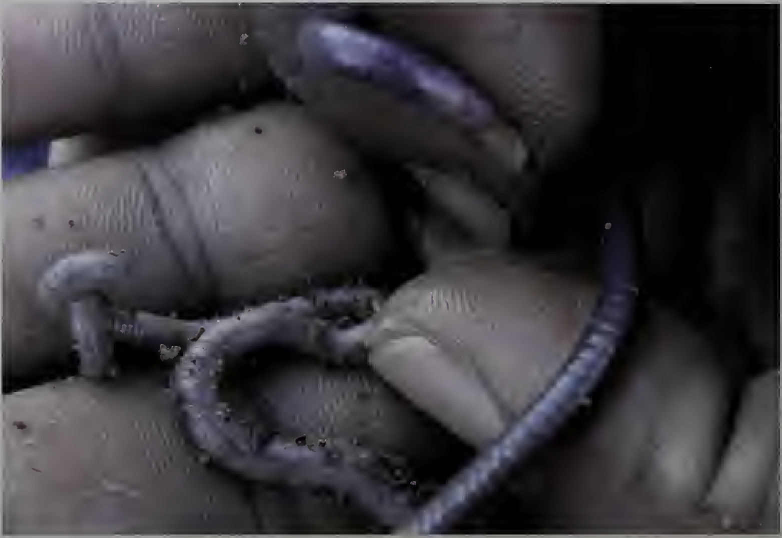


Vichwa vya huyu cicilia havina macho yanayonekana, mdomo umefichwa chini ya kichwa na minyiri huweza kuhisi mwisho wa shimo.

Huyu cicilia wa Sagalla ni tofauti na wale wanaopatikana kwa milima mingine ya Taita. Huyu alipata kutambuliwa kisayansi mwaka wa 2005 lakini watu wa Sagalla kitambo walimfahamu kama mng'ori. Huyu cicilia sasa ako na jina lingine la Kisagalla: kilimamrota. Kama vile jina linabashiri huyu cicilia hushi Sagalla na kama wale cicilia wengine yeye huishi tu kwa mchanga mweusi wenye rutuba na unyevu. Hii inamaanisha ya kwamba sehemu nyingi za Sagalla sio sawa kwa makaazi yake haswa mashamba ya eucalyptus na huko chini kulio kukavu.

Ni machache yanayojulikana kuhusu huyu kiumbe, lakini tunadhania kuwa yeye huzaana wakati wa vuli na mayai huwekwa kwa mashimo

Boulengerula niedeni (kuendelea)



Kwenye mkono: Mnyoo wa mchanga (kushoto) nitofauti kabisa kutoka cililia wa Sagalla (kulia).

madogo kwa mchanga. Wadogo pengine hula ngozi ya mama, kabla ya kukomaa. Huyu cicilia wa Sagalla hula ming'ori na mchwa pamoja na wadudu wengine wadogo wanaoishi kwa mchanga.

Juu huyu kiumbe huishi kwenye sehemu ndogo ya Sagalla na juu ya shida za kuenea kwa kupandwa kwa miti ya eucalyptus na mmomonyoko wa udongo, huyu kiumbe anakabiliwa na tishio kubwa la kuangamia. Unaweza saidia kulinda huyu mnyama kwa kuzuia mmomonyoko wa undongo kwa shamba lako, kutoa mimea isiyo ya kiasili haswa miti ya eucalyptus na kupunguza matumizi ya dawa za wadudu na kwekwe. Huyu mnyama huonyesha udongo una rutuba ya kutosha na kile kizuri kwa cicilia wa Sagalla ni kizuri kwa mkulima pia.

kilima mrota

Maelezo ya pembeni

Marejeleo zaidi

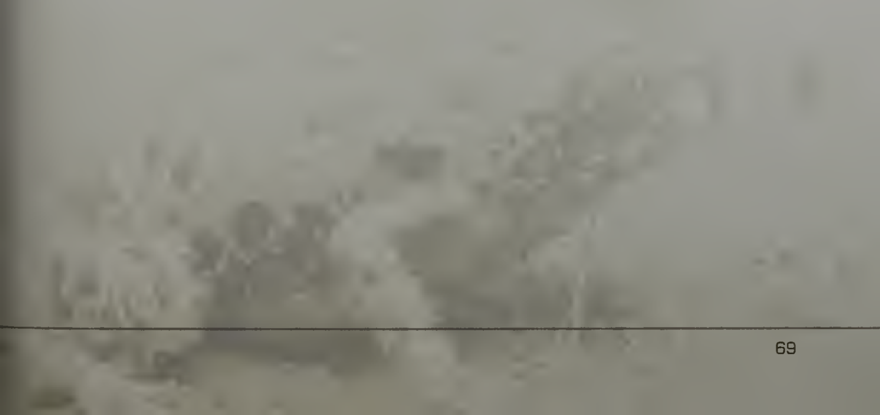
Kama ungetaka maelezo zaidi kuhusu amfibia wa Milima Taita, ama kwingineko Afrika Mashariki soma vitabu vifuatavyo:

Channing, A. & Howell, K. 2005. *Amphibians of East Africa.* Chimaira & Cornell University Press, Frankfurt and Ithaca.

Spawls, S., Howell, K.M. & Drewes, R.C. 2006. *Pocket guide to the reptiles and amphibians of East Africa.* Black, London.

Milima ya Taita ina reptilia wapatikanoa hapo peeke kama walio kwenye picha hapa. Unaweza kusoma mengi kuhusu reptilian wa Afrika mashariki kwenye:

Spawls, S., Howell, K., Drewes, R. & Ashe, J. 2002. *A field guide to the reptiles of East Africa.* Natural World, San Diego.



Vikundi na mashirika

Kama ungependa kujihusisha na kutunza amfibia ama mazingira kwa jumla kuna hivi vikundi na mashirika unaweza kujiunga nazo.

Herpetological Association of Africa
Michael F. Bates
Department of Herpetology
National Museum
P.O. Box 266
Bloemfontein 9300,
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or search for 'Herpetological Association of Africa' on the web

Nature Kenya
P.O. Box 44486-00100
NAIROBI
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http://www.naturekenya.org

East African Wildlife Society
P.O. Box 20110-00200
Nairobi
Tel +254 020 3874145
Fax +254 020 3870335
info@eawildlife.org
http://www.eawildlife.org

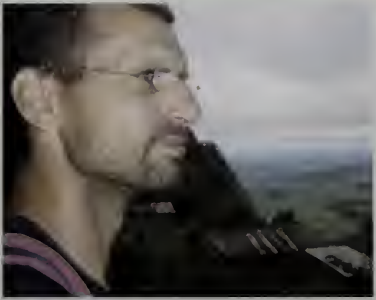
Ukipata amfimbia ambaye unafikiria ni speshelia (kwa mfano aliye wekwa alama) ama unataka mtu wa kumtazama, tafadhali wasiliana na:

Herpetology Section
National Museums of Kenya
Museum Hill Road
P. O. Box 40658-00100
NAIROBI, KENYA
Tel: +254-(0)20-3742161/31-4 Ext 2245
kmalonza@museums.or.ke
http://www.museums.or.ke

Kuhusu waandishi

John Measey

John Measey ni mtafiti wa biologia ya amfibia na hufanyia kazi shirika la SANBI lililoko Cape Town Afrika Kusini. Alikuja Taita kwa mara ya kwanza mwaka 2002 kufanya utafiti kuhusu amfibia aina ya cicilia pamoja na wanasayansi wa Makavazi ya kitaifa Ya Kenya. Tokea wakati huo ametembelea Taita mara kadhaa na kugundua mengi kuhusu amfibia bali na kuwa na marafiki wengi.



Patrick Malonza

Patrick Malonza hufanya kazi katika Makavazi ya Kitaifa ya Kenya mjini Nairobi kitengo cha hapetolojia. Yeye alikuja Taita pamoja na John kutafiti kuhusu amfibia aina ya cicilia. Baadaye alirejea kufanya utafiti wake kwa ajiri ya masomo yake kuhusu amfibia wa Taita.

Vincent Muchai

Vincent Muchai pia hufanya kazi katika Makavazi ya Kitaifa ya Kenya mjini Nairobi kitego cha hapetolojia pamoja na Patrick. Kabla ya hiyo alikuwa amefanya utafiti kuhusu anuwai ya amfibia wa Kakamega. Alikuja Taita mwaka wa 2008 kusaidia kwa utafiti wa cicilia wa Sagalla na chura *Callulina* ambao wanakabiliwa na hatari ya kuangamia.

Wasaidizi

Kazi nzuri katika hiki kitabu haingewezekana bila jitihada na wasaidizi huko Taita ambao walifanya utafiti wa amfibia wote waliotajwa katika kitabu hiki. Tungehimiza waruhusiwe kuedelea katika nafasi hizi siku za usoni ili waweze kuwatia motisha vizazi vijavyo Taita kutunza hawa wanyama wa ajabu.

Peter Alama

Peter Alama anatoka Piringa, ambapo anaishi na mama yake na ndugu zake wawili. Peter alivutiwa na wanyama toka kitabo na hakusita kuchukua nafasi ya kufanya utafiti juu ya amfibia wa Taita. Amemakinika hasa kutafuta vyura wale wadogo hata kama wale wakubwa humponyoka.

Renson Dio

Renson Dio huishi Jora karibu Mlima Kasigau pamoja na bibi yake na Familia yake. Yeye amepanda huo Mlima mara nyingi sana na pia kutembea kilomita nyingi kusaidiana na wale wasaidizi wengine huko Dawida, Mbololo na Sagalla.

Bigvai Karingo

Bigvai Karingo anatoka Mbololo, ambapo yeye ana biashara ndogo ya duka huko Wongonyi. Yeye aliufahamu huu mlima vyema, lakini wakati wa huu utafiti akapata kutembelea sehemu zingine Taita akitekeleza kazi zake ipasavyo na kupata vyura.

Greshon Kishombe

Greshon Kishombe anaishi Sagalla na wazazi wake. Yeye amezuru sehemu za huu mlima ambazo hakuwa ametembea kabila ya huu mradi, akipata mng'ori ambao ni nadra katika sehemu kadhaa. Yeye aliacha huu mradi mwanzo wa 2008 kutafuta riziki kwingine.

Oliver Mwakio

Oliver Mwakio aligundua kuwa yeye amefaulu kama mwanabiolojia. Yeye ni makini sana kwa msitu na tayari kunakiri kwa kitabu chake kuhusu amfibia wa Taita. Yeye saa hii anafahamika vyema sana Chawia na hata kwao nyumbani Mwachora.

Peter Mwasi

Peter Mwasi amekuwa na aari ya kujua kuhusu ndege wa Taita lakini tulimshawishi kuwa kuna wanyama wengine anaoweza kuwagundua. Peter ni wa kutegemewa hasa kwa kuwapata chura na cicilia mahala popote hanapofanya kazi. Peter hivi sasa anaishi na bibi yake pale Kirema karibu msitu wa Ngangao na anatarajia kufanya kazi zaidi katika misitu ya Taita.

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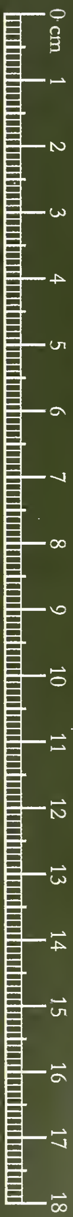

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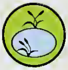
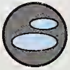
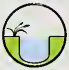
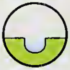
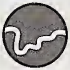
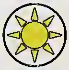
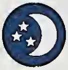
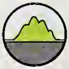
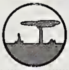
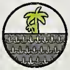
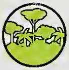
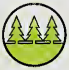
habitat	pond	
	puddle	
	river	
	stream	
	underground	
day / night	day	
	night	
altitude	high	
	low	
vegetation types	shamba	
	forest	
	plantation	

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Amphibians of the Taita Hills

by

G.J. Measey, P.K. Malonza and V. Muchai

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The South African National Biodiversity Institute (SANBI) was established on 1 September 2004 through the signing into force of the National Environmental Management: Biodiversity Act (NEMBA) No. 10 of 2004 by President Thabo Mbeki. The Act expands the mandate of the former National Botanical Institute to include responsibilities relating to the full diversity of South Africa's fauna and flora, and builds on the internationally respected programmes in conservation, research, education and visitor services developed by the National Botanical Institute and its predecessors over the past century.

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Foreword

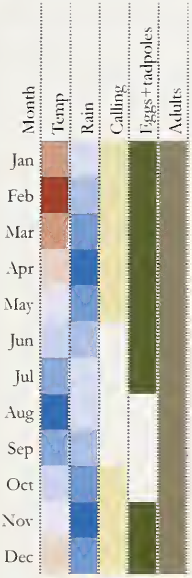
This book documents amphibians found in the Taita Hills. Amphibians are some of the least known animals and also not very much liked due to their slimy bodies. They are also among some of the most threatened animals due to human activities. This book will help demystify what amphibians are and their importance in conservation. I hope this will help the readers start appreciating these animals and the importance of conserving their environment and especially the indigenous forests on which most of them depend. I want to believe that you will develop pride (as I did) in the knowledge that some of these only occur in Taita and nowhere else in the WHOLE WORLD.

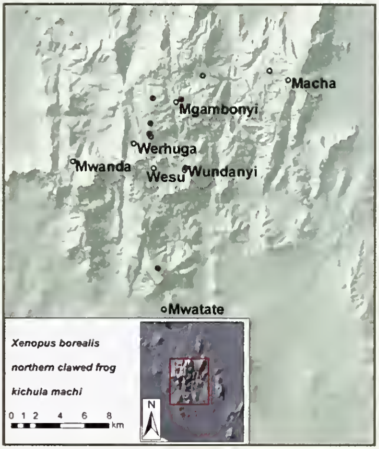
We live in a rich and beautiful place that must have been even richer and more beautiful before we cleared much of the indigenous forest cover. The Taita Hills has lost over 98% of its forest cover over the last 200 years, according to scientists. It is our onus to see that no more loss occurs and instead try to restore this beautiful place as much as we can. This will benefit us in several ways such as increased watershed services, improved food security and also conserve the unique biodiversity (*Uhaiwai*) we have.

The hard work and dedication of the authors has resulted in a work of such comprehensiveness that is sure to impart valuable knowledge to the readers.

James Mwang'ombe
Project Coordinator
The East African Wild Life Society
10 October 2008

Explanatory notes





The calendar shows relative monthly changes in rainfall and temperature as shades of blue and red. The following bars indicate when males are calling, when eggs and tadpoles can be found, and lastly when adults can be found.

Average sizes of males and females are given relative to a human hand size. Individuals that you find may be smaller or larger than these average sizes.

The maps indicate places where we have found each species of amphibian. It may be possible to find them in other places, and we encourage you to look!

Acknowledgements

We thank the Critical Ecosystem Partnership Fund for supporting research on amphibians in the Taita Hills and the production of this guide.

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Page 3:	Mwangi Githuru:	*Turdus helleri*
Page 8:	César Barrio:	*Salamandra algira*
Page 23:	Anthony Herrel:	*Callulina dawida* tag
Page 49:	Alan Channing:	*Amietia angolensis*
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Biodiversity

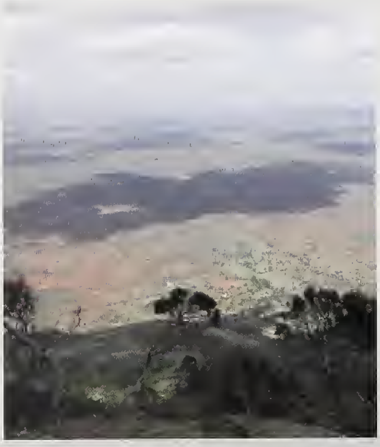
Biodiversity is an expression of the biological diversity within a particular area: diversity can be measured from genes to ecosystems, although the most common unit is the number of species. In temperate areas, the number of species is well known as biologists have been working there for a long time, but many areas of the world have not been investigated well and contain unknown levels of biodiversity. In 1999 some scientists investigated the patterns of biodiversity on Earth and concluded that some areas were very special as they contained high numbers of species in well-defined areas that were also under threat. These places they called 'biodiversity hotspots'. Of the 12 biodiversity hotspots that they described, one was called 'Eastern-Arc Mountains and Coastal Forests' in East Africa.

The Eastern-Arc Mountains stretch from the Udzungwas in the far south of Tanzania to the Taita Hills in southeastern Kenya. The mountains in this area are all of the same age (around 200 million years) and have consistently trapped rain clouds coming from the Indian Ocean. This has meant that these mountains have maintained the hot and wet climate which supports natural forests for many millions of years and long before humans inhabited the area.

During this very long period the climate in the area was not stable but went through many wet and dry phases, each lasting many thousands of years. The consequence was that the lowlands became forested (during wet periods) and then turned into savanna (during dry periods). The tops of the mountains of the Eastern-Arc stayed forested the whole time, so that these forests were occasionally connected together in wet periods and separated in dry periods. This gave a chance for the animals and plants that live in the forests to move and spread between mountains, and become separated and isolated into the mountain refuges during dry times. Imagine that if the whole area was once forested and now all those species of plants and animals are concentrated into the forests on the tops of the mountains!

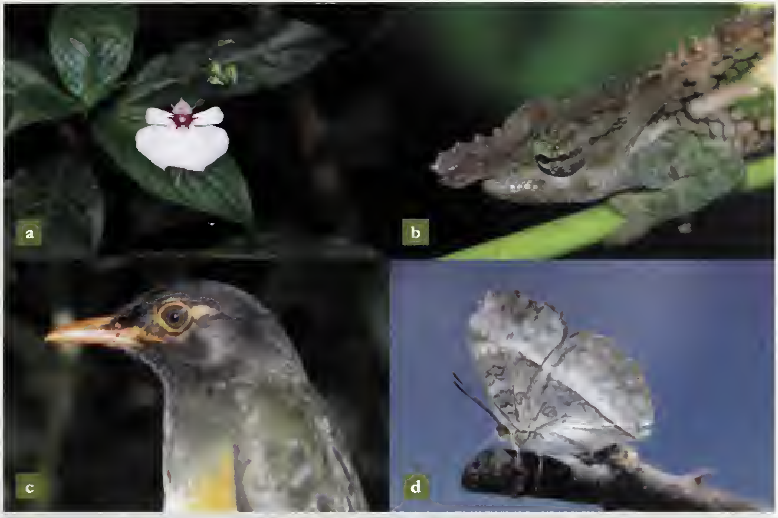
Now, we live in a dry period of this region's history and the savannas form a barrier for most forest animals or plants which cannot move between the mountains of the Eastern-Arc. It is believed that the many changes between connectedness and isolation of the Eastern-Arc Mountains are responsible for the high number of species found in this biodiversity hotspot. At this time (and during dry periods before), the Eastern-Arc

Areas that were once covered in forest are now bare with only small patches of trees which are mostly exotic.



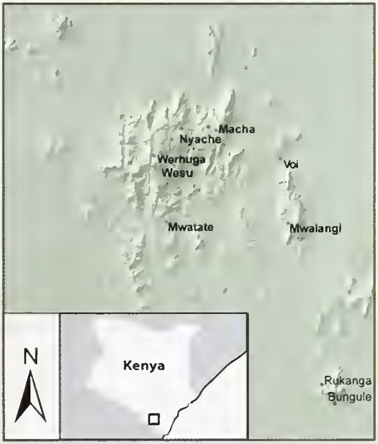
In the lowlands, between the Eastern-Arc Mountains, rainfall is low.

Mountains act as a refuge for many thousands of species which cannot live in the dry savanna. It is possible to think of the mountains as islands of forest surrounded by a sea of savanna. As the species which live in these forests have been isolated for many thousands of years, they have become unique and many exist only on top of individual mountains. We call these species 'endemic' to the particular area they come from. The Eastern-Arc Mountains contain many endemic species which occur nowhere else in the world, and of all the vertebrate animals, the amphibians have the highest total number of species, probably highest in all of Africa.



Endemic species in the Taita Hills include a, Taita imprezia (*Impatiens taitana*); b, the Taita chameleon (*Kinyongia boehmei*); c, the Taita Thrush (*Turdus helleri*); and d, the Taita Cymothoe butterfly (*Cymothoe teita*).

It should come as no surprise that the Taita Hills has a number of endemic animals and plants, species which occur nowhere else in the world. These include the Taita thrush, the Taita African violet, as well as butterflies, millipedes and snails to name but a few. This book is about all of the amphibians in the Taita Hills, whether or not they occur outside, but we will pay special attention to the endemic species of the Taita Hills, where they live and how to identify them. It is our hope that when you know what they look like you will help to preserve and protect these unique and special animals.



The Taita Hills lie in the southeast of Kenya, 160 km northwest of the Indian Ocean.

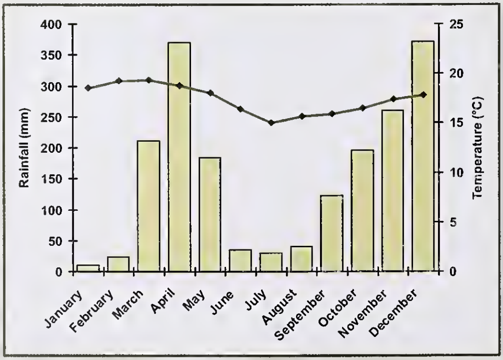
Climate in Taita

All of this area of Eastern Africa has two distinct rainy periods in every year, the 'Masika', which are long heavy rains from March to May, and the shorter lighter 'Vuli' from October to December. During the dry season a little rain occasionally falls so that no month is completely dry. Unlike the rain, the temperature has a single cold period (in July) and the hottest time in February.

Rainfall

Some places in Taita are wetter and others drier. In general, higher places are wetter as they catch more of the rain clouds that are passing (for example Mghange and Vuria). But some places are in the 'rain shadow' of mountains which take most of the rain from the clouds. The rain comes from the Indian Ocean in the southeast, so places which are in the northwest of Taita and behind mountains receive less rain. A good example is the area of Irizi. This is a very dry area although it is at the same altitude as Wundanyi, which is very wet. Irizi is in the 'rain shadow' of Ngangao which takes most of the rain from the clouds before it reaches Irizi.

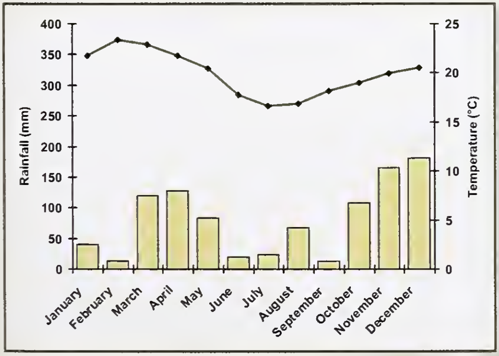
Different years also have different amounts of rain, and this can include rainstorms during dry periods. A good example was in 2007 when two unseasonal showers deposited nearly 100 mm of rain over much of Taita. However, the dry seasons are never completely dry as any cloud cover brings water in fog to the highest places. Natural forests are particularly good at trapping this



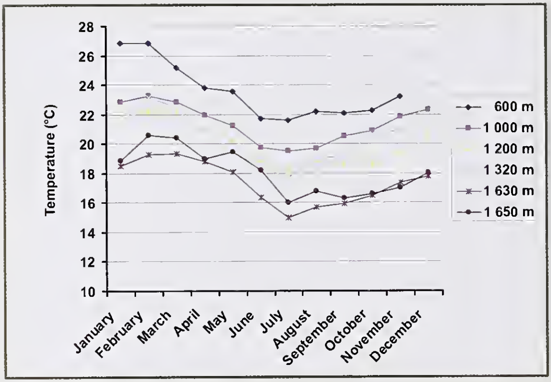
Rainfall and average temperature at Mwachora in 2006 (collected by Oliver Mwakio). Mwachora is a relatively high area (1 630 m asl) and receives much rain.

In the rain shadow. Although this area is at 1 400 m asl, the area is dry with candelabra trees and relatively few amphibians.

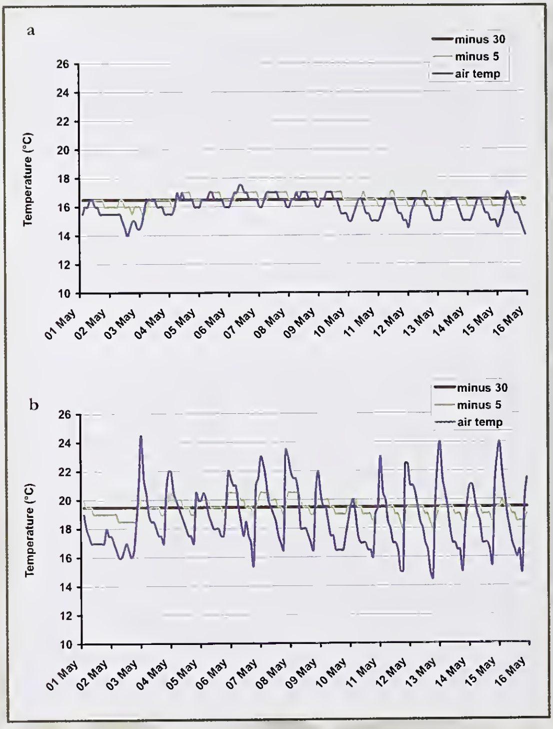
'horizontal precipitation' and direct the water down to the roots. This means that in natural forests the soil is always moist and streams are able to flow year-round providing much needed drinking water to people living around them. Plantations of eucalyptus are especially bad at this



Rainfall and temperature data for Chawia in 2007 (collected by Christopher Ngeti). At 1 604 m asl, Chawia is almost as high as Mwachora but receives much less rain as it is in the 'rain shadow' of Iyale.



Average monthly temperature data from Jora (600 m asl), Piringa (1 000 m asl), Sagalla (1 200 m asl), Mbololo (1 320 m asl), Mwachora (1 630 m asl) and Ngangao (1 650 m asl) in 2006. The higher the site, the cooler the average temperature, but all sites have the same pattern with highest temperatures in February and lowest in July.



Temperature data from (a) Ngangao Forest and (b) a Wundanyi shamba for the first 15 days of May 2006. Notice how the air temperature (blue) varies a lot, while the soil temperature (green) has even less variation, while deep in the soil (brown) the temperature is constant. The forest temperatures are buffered by the deep shade of the trees while on the shamba the air temperature undergoes large peaks and troughs.

Note that 9 May was a cloudy day (with heavy rain!), but on 10, 11 and 12 May it was hot and sunny.

as they soak up all the water deep into the ground. Streams that used to flow in some areas dried up once eucalyptus was planted. The situation is so bad in Sagalla that no water can be dug from the ground in the dry season.

Temperature

The average temperature is directly related to altitude so that the hottest areas are in the lowlands, whereas the coolest are high in the mountains. Daily temperatures are very variable and can change depending on the presence of clouds (cooler in the day and warmer at night) or clear skies (hotter in the day and colder at night). They can also change depending on the vegetation. Forests often feel cool to walk in but at night they are warmer than shambas as they trap the warmth of the day.

As you might expect, soil temperatures are almost constant deep down, and as you approach the surface it is possible to experience daily changes in temperature. There is also a difference between shamba and forest. The deep shade of the forest insulates the air inside so that forests always feel cool on the hottest of days. At night, the air in the forest does not get as cold as that outside so that the forest feels warmer.

Amphibians get their body heat from the environment around them, as do reptiles and invertebrates. The name for this is 'ectotherm' meaning outside (ecto-) and temperature (-therm). Amphibians do best in a warm, moist environment, so the abundant rain and warm weather in the Taita Hills is very good for them. However, the habitat in which they occur can mean a big difference in temperature and humidity. Natural forests are places with very constant temperature and are always moist. Shambas can vary greatly in temperature and get very dry and very wet. Therefore, different species of amphibians occur in the forests and shambas, while some occur in both.

Rain falls inside the dark forest where the temperature is quite stable.

Amphibians

Amphibians are vertebrates (animals with a back-bone) which have a special moist skin which they can use to breathe oxygen, as well as a set of lungs like us. They lay eggs which have no shell but are coated in jelly. These attributes of amphibians mean that they are commonly associated with water.

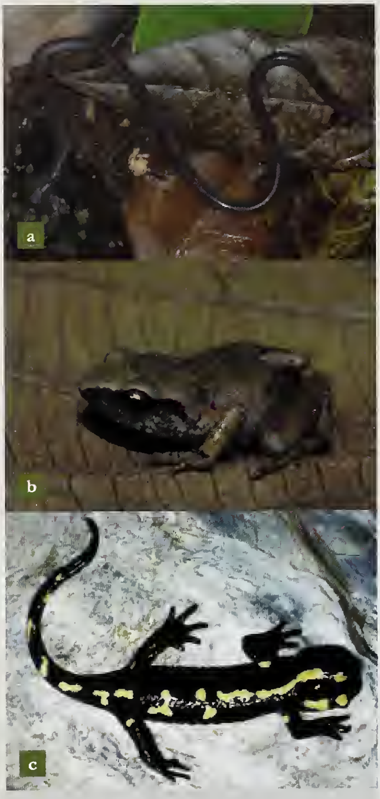
The Earth has three groups of amphibians known as frogs, salamanders and caecilians. Sub-Saharan Africa has only frogs and caecilians and both groups occur in the Taita Hills.

Metamorphosis

In school we usually learn about the classic life cycle of an amphibian: jelly-coated eggs are laid in water, these hatch into tadpoles, tadpoles grow bigger, sprout legs and finally go through a metamorphosis when the tail shortens and the legs lengthen to become the juvenile frog which then grows into an adult.

Amplexus

In most frogs, the male grasps the female around her waist or behind her fore-limbs prior to egg laying and fertilisation. This pair of frogs is said to be 'in amplexus' (Latin for embrace), inguinal or axillary, respectively. This is not 'mating' as the eggs are not fertilised until the animals go to the laying site, and the



Photographic examples of each order—a, caecilian; b, frog and c, salamander.

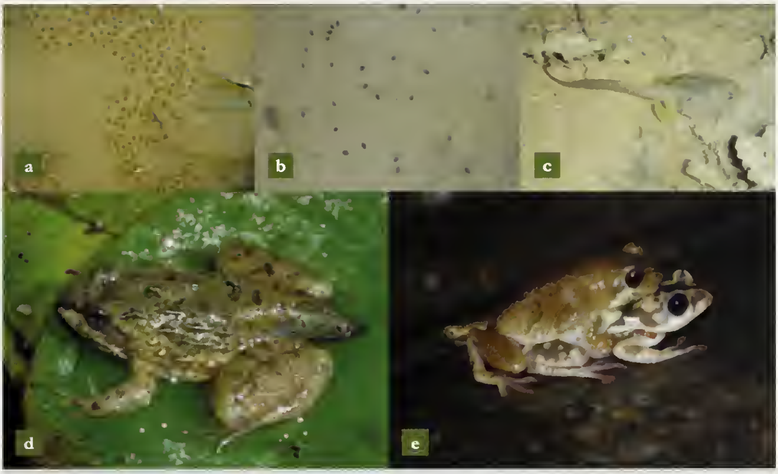


Diagram of life-cycle and photographs of stages—a, eggs; b, small tadpoles; c, big tadpoles; d, metamorph and e, adults in amplexus.

position may change for them to do this. Also, not every male which grasps a female will fertilise her eggs as females may reject males, or grasping males may be displaced by other males.

In the Taita Hills it is not hard to see this classic amphibian life cycle of metamorphosis. Try looking in any pond or ditch of water during the wetter months. From June to September many of these dry up which means that these species have a seasonal reproduction tied to the availability of water.

Male frogs call to advertise their presence to females and each species has a distinct and different call. Most people are very familiar with these sounds even if they do not know that it is a frog that is making it! At the onset of the rainy season (October–November) the calls are very noisy and seem to come from any area where water accumulates. Some species only breed at this time, while others continue calling and breeding throughout the short and long rains.

Female frogs attracted to the calls of males are able to choose an individual from the sound of his call. Once chosen the female's back is grasped by the male (usually smaller), and the pair go to lay eggs. Some species deposit them directly into water in strings, clumps or floating mats. Others lay them on leaves

Hyperolius glandicolor male calling.

just above the water so that when the tadpoles hatch they drop into the water and immediately begin to swim.

The tadpoles have a diet very different from the adults. Most eat green plant material called algae that grows abundantly in fresh water, often giving it a green appearance or coating submerged objects in a green slime. The tadpoles graze this food with special teeth. Each species has a unique set of teeth and these can be used to identify which tadpole turns into which frog.

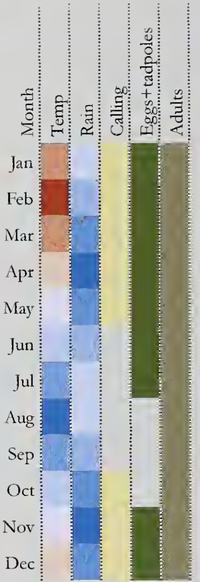
Direct development

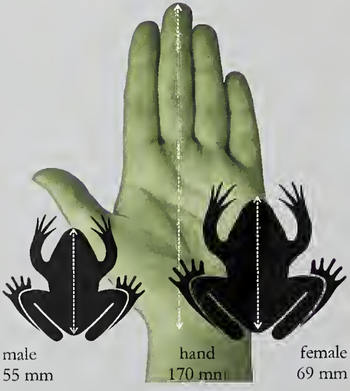
But not all amphibians have a free living 'tadpole' stage. Several species in the Taita Hills do not lay eggs in

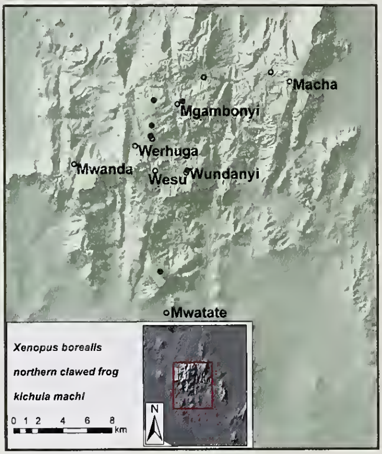
Eggs of the caecilian *Boulengerula taitana* show embryos already developing curled around the yolk.

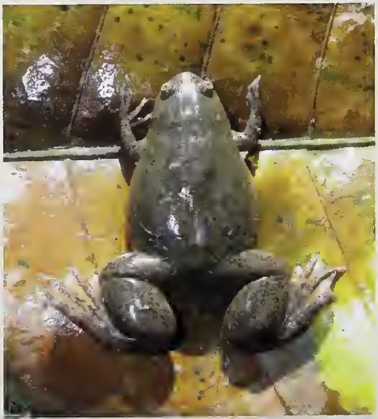
water instead they are laid within the leaf litter of forests or in the moist soil underground. These species have the advantage that they do not have to return to water in order to breed. They do not even have to wait until it rains to lay their eggs. This independence from water means that they can occur anywhere, often far from water. Their eggs have the same sort of jelly coating as described above; this can dry out so they must still find somewhere moist to lay their eggs. These frogs and caecilians are perhaps the most fascinating amphibians of the Taita Hills. They include all of the endemic species (see page 3) and much of their natural history was unknown before we made this study. We hope that you enjoy reading about them as much as we have enjoyed studying their fascinating way of life.

Xenopus borealis



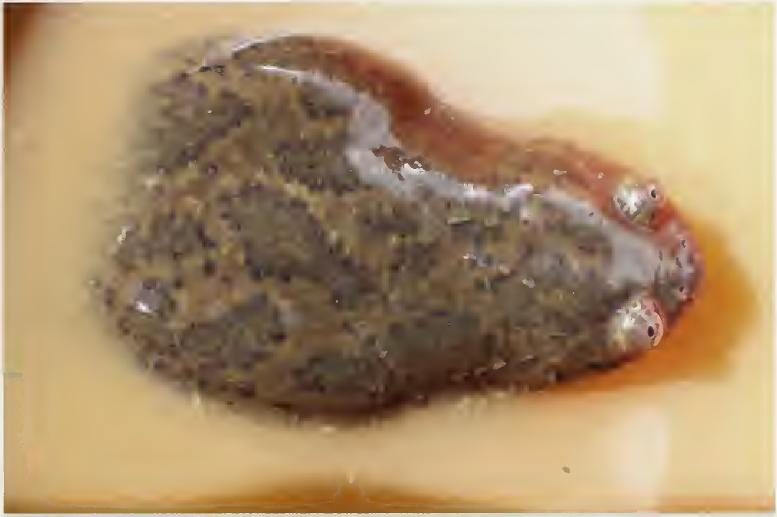






Out of water this looks like a very strange frog that moves with difficulty. Note black tips to claws on the feet.

northern clawed frog

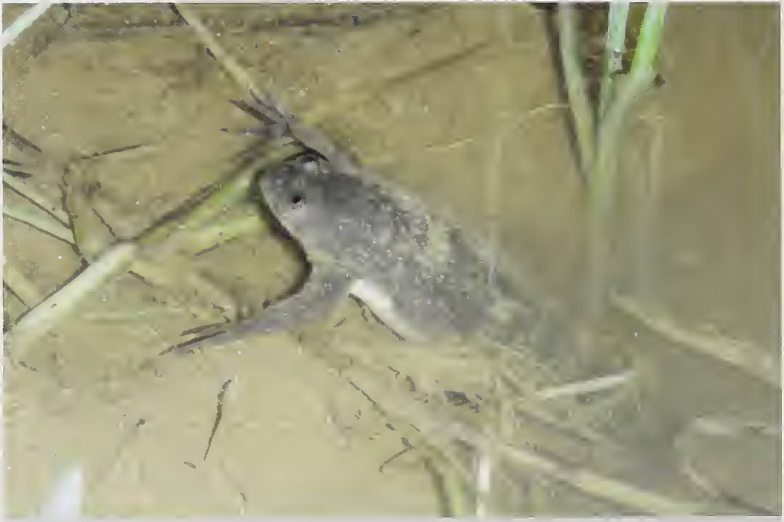


A northern clawed frog breaks through the surface of a typically muddy puddle. Note stitch-like appearance of lateral line organs in lines over the body and around the eyes.

Most frogs are very good at moving on land as well as in water, and either jump or walk very quickly out of the way. Clawed frogs are poor movers on land but they can be found there, during heavy rainstorms, as they seem to flop uncertainly about, or when their pond dries and they move to occupy another. Although not good at moving on land, these frogs are very good at swimming. It is easiest to see them at night shining a torch into the ponds or water-filled ditches where they live. If you startle them, they disappear very quickly into the mud. Sometimes they appear to hang motionless from the surface while at others they are very active eating insects from the water surface or even launching themselves out of the water to snatch a passing insect.

Once in the hand, this species is very distinctive and hard to confuse with any other in Taita. The hind feet are very large and fully webbed with prominent black claws on the tips of the first four toes (hence the

Xenopus borealis (cont.)



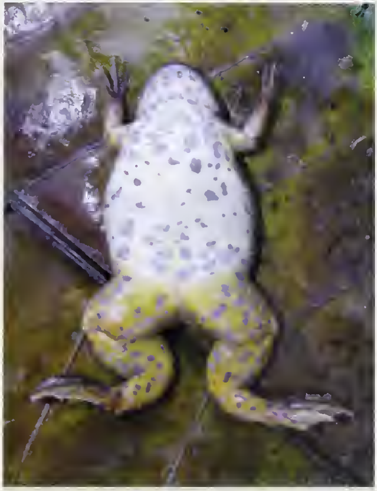
These frogs often sit in water at night with their fingers outstretched feeling for movement of a potential prey item.

name 'clawed frog'). They appear to be covered in 'stitches' which are sensory organs which can detect movement in the water around them. In fact, they use these organs to locate their food which consists of almost everything in the water, including insects, fish, and tadpoles; even their own! They are also very smooth and slippery, quite hard to keep hold of, and can scratch hard using their claws.

Tadpoles of this species look rather like small fish.

During and after heavy rains you might be able to hear the males calling a 'brrrrr brrrrr brrrr' sound if you get close to the water surface. Males grasp the females at the top of the back legs and the couple swim in tandem around the pond depositing single eggs on vegetation, rocks or stones. The tadpoles are also unlike any other species in Taita as they are almost transparent, hang in the water with their tails flickering, and filter algae from the water. Two long barbs come from the corners of their mouths giving them the appearance of a catfish, but the eventual growth of legs will betray their amphibious nature.

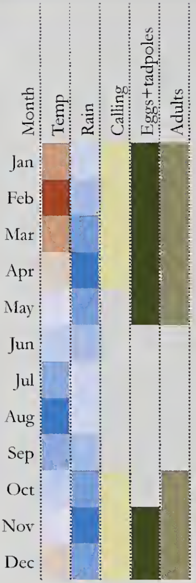
This species occurs in the highlands of Kenya and Tanzania, and probably in Uganda too.

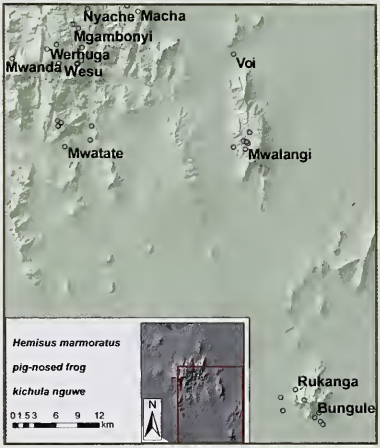


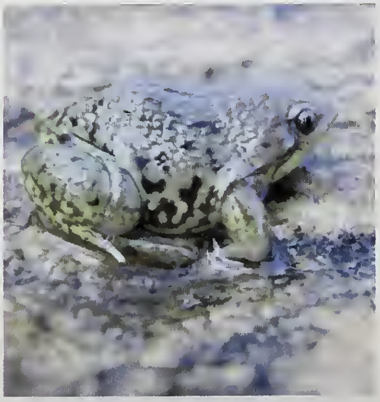
The underside of the northern clawed frog is speckled with orange on legs and arms.

Notes

Hemisus marmoratus

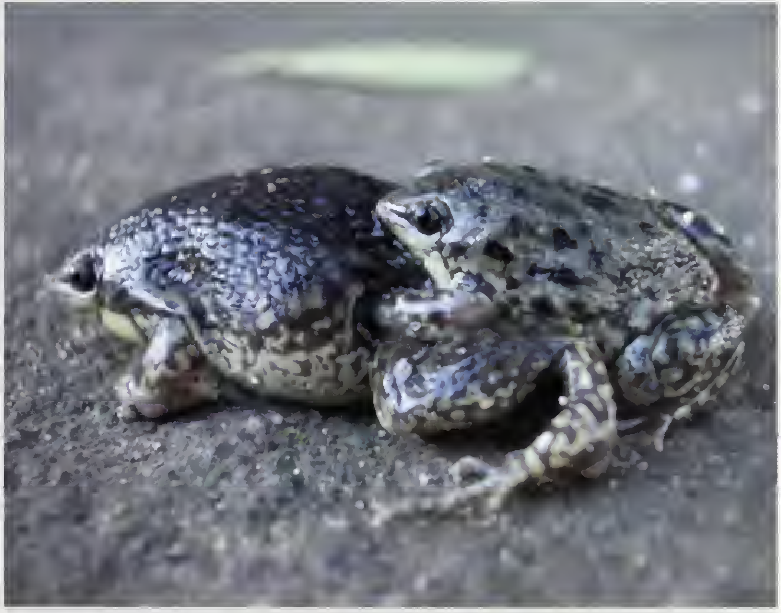






The pig-nosed frog has a narrow snout and marbled coloration.

pig-nosed frog



The female is much bigger than the male which digs his hands into her sides to maintain his position during mating.

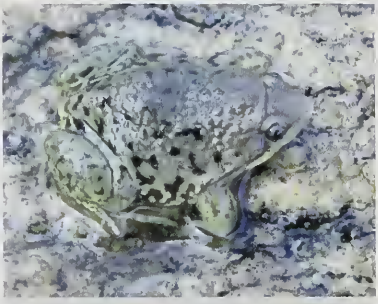
It would be hard to confuse this species with other frogs in Taita. It uses its small pig-like head to burrow head first into the soil in very wet and sandy places near streams and rivers where it spends the day. This is one of the frogs that are commonly unearthed when digging in shambas, especially in sandy soils. At night, especially after rains, they come out of the soil and move around shambas eating small insects which they catch by shooting out their sticky tongue. In certain areas, like in the Mwatate or Sagalla valleys this is a very abundant species, but in other areas, at high altitudes or on the steep slopes of the Taita Hills, it is rarely seen.

These frogs have a narrow snout from which they 'shoot' (different

Hemisus marmoratus (cont.)

from all other frogs which 'flip') a very special small tongue. The tongue has two lobes which surround the ant or termite as soon as it hits it. As termites and ants move around quite fast, the frog is able to adjust its aim to hit its prey. The size of the snout is so small, these frogs can't eat bigger prey, instead they specialise on termites and ants.

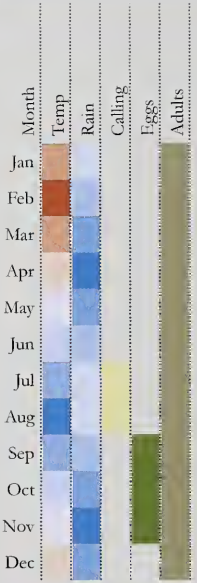
Calls of the pig-nosed frog can be heard in both rainy seasons with males producing a distinctive 'quwack' from areas right next to the breeding habitat. The legs of this species are quite short, so they dig them into the sides of the female when holding her. Together, they lay eggs in a clutch in a hole up to 500 m from still water. The tadpoles hatch inside the hole and move across the intermediate ground when the area is flooded. The tadpoles have a distinctively large tail fin.

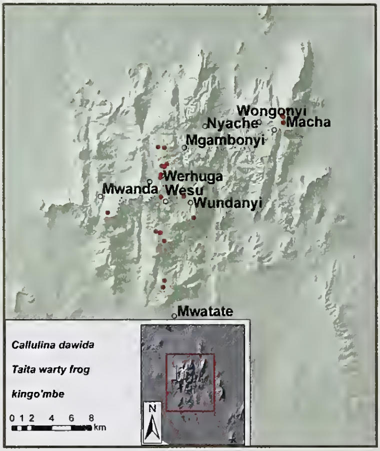

Pig-nosed frogs can be found moving around in sandy areas after heavy rains

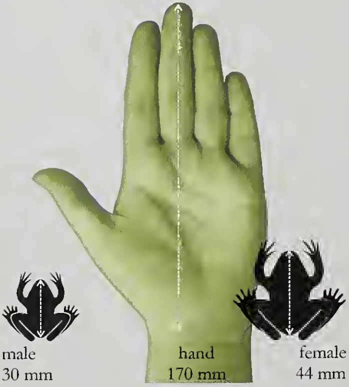
This species occurs in a large area outside of the Taita Hills, from South Africa all the way to Egypt and West Africa.

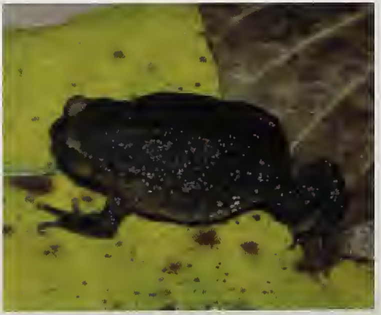
Notes

Callulina dawida







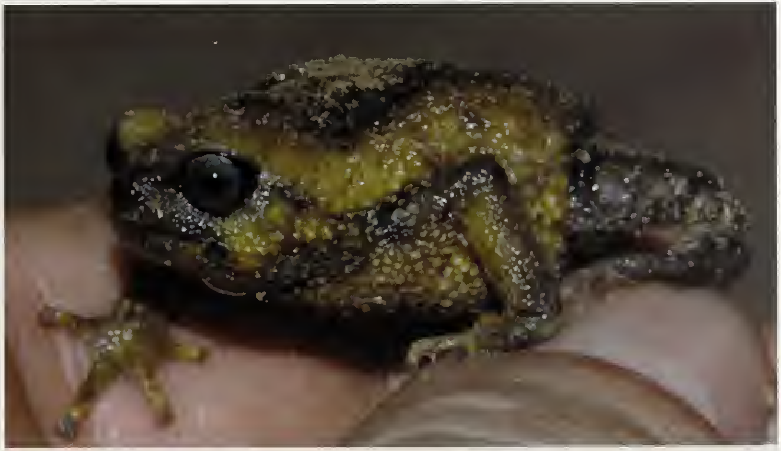


This frog moves slowly in the leaf litter, giving it the local name kingo'mbe.

Taita warty frog

Critically Endangered

Taita endemic



Many animals have bright blue eyes, and the pattern of their skin can be brown/yellow resembling the dead leaves of the forest floor.

Although we are familiar with most frogs jumping, this species walks much like a cow across the leaf litter in the indigenous forests of Dawida and Mbololo. Its short legs and long fingers seem best adapted to climbing small trees and vines. During the day animals hide in the leaf litter, but during the night they climb into the low branches of small trees in the forest from where males call in short pulses 'kru kru kru'. It has a warty skin which produces a very sticky substance if picked up. When disturbed it inflates its body to make it appear larger.

This species only occurs in the indigenous forests of Taita. As there is so little habitat left and the distances between populations are large (fragmented), this species is considered to be Critically Endangered. This means that active conservation measures are needed in order to keep this frog from going extinct. Individuals have been found to occur in small patches of

Callulina dawida (cont.)

A newly hatched frog is so small that it sits comfortably on a finger tip.

indigenous trees on shambas, and these places may be very important for these frogs to move between one forest fragment and the next. By keeping these small patches undisturbed on your shamba, you can help protect this species from extinction.

Our study of this animal in the Taita forests has revealed some of the strange reproductive behaviour. Around 40 eggs are deposited on a large leaf in the leaf litter of an indigenous forest in August or September during the long dry season. This species reproduces by direct development (see page 10) so there is no tadpole living in water. The female then sits on top of the eggs protecting them from would-be predators, like insects or birds. But only a small number of the eggs are actually fertile, the rest form a kind of moist nest for these fertile eggs to rest in so that they don't dry out.

The female sits on the eggs for 3 months until they are ready to hatch as small frogs. Toward the end of this period, once the rains have started, the female may eat the infertile eggs, ensuring she has enough energy to survive their incubation. The very small (around 10 mm long) frogs that hatch at the

Numbered tags can be seen as an orange rectangle under the skin of the frog. Can you read the numbers of this individual?

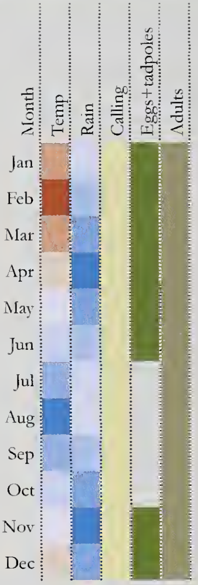
beginning of December grow very quickly, doubling their size in four months, by eating small insects in the leaf litter. They can also climb to escape predators such as Safari ants. In another year they have almost reached the size of an adult and prepare to breed for the first time.

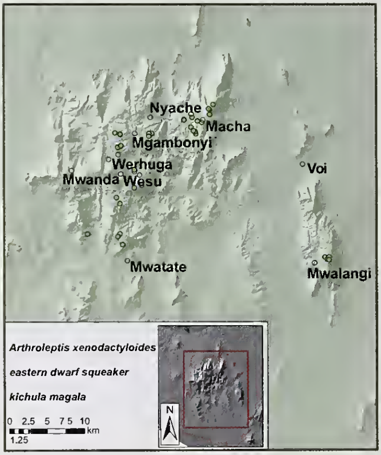
There is still a lot more that we need to learn about this species in order to help with its conservation. More than 100 frogs have been marked individually with small tags (see left/across) on their inner thigh. If you should come across one of these animals with a tag then please write down the tag number, leave the frog in the forest and contact James Mwang'ombe at the East African Wildlife Society office in Wundanyi.

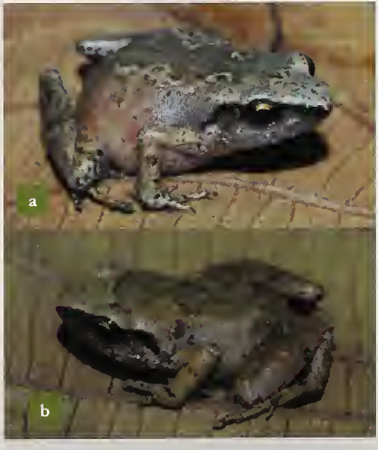
This species occurs in the Taita Hills and nowhere else in the world.

Notes

Arthroleptis xenodactyloides

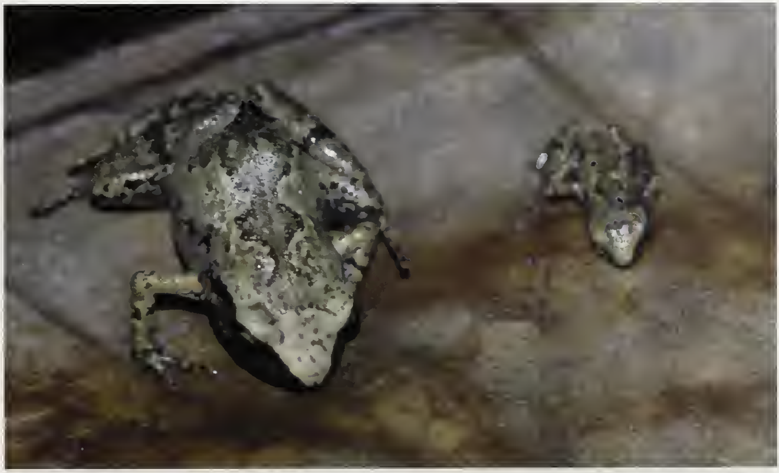






Females (a) are larger than males (b) and are often swollen with eggs making them much fatter.

eastern dwarf squeaker



The size of a newly hatched juvenile is less than half of an adult, even though the adults are small. Many of these frogs have a characteristic hourglass pattern on their backs.

The dwarf squeaker is abundant in Taita and can be found in any of the forests or plantations. It lives in and on the leaf litter of the forest where it hunts for small insects amongst the leaves. The frogs are very small with females reaching 20 mm long and males only 17 mm long; small enough to sit on your thumbnail. They are the same colour as dead leaves varying between beige, brown to black, often with an hourglass-shape pattern on their backs. The male's call is a tiny cricket-like squeak, that can be heard coming from the forest all year round, especially after rain. The frogs occur in patches, so you can find them easily just by walking in a forest toward the calling and watching closely at your feet. They are only just a little bigger than crickets and after jumping, disappear under the leaves.

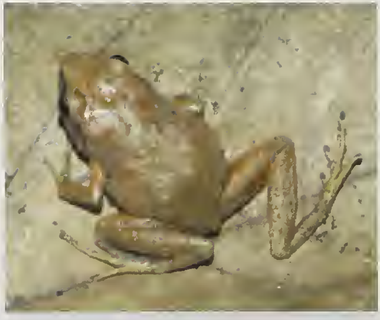
When mating, the males stick to the backs of the females, and the pair then deposits about 25 eggs in the leaf litter. The males stay in the same area and may guard the eggs. This is a direct-developing species (see page 10) and so around 30 days after laying, they hatch directly as small frogs, only 5 mm long. They grow

Arthroleptis xenodactyloides (cont.)

quickly reaching adult size in less than six months.

Genetic studies on these frogs in Taita have suggested that they get displaced during storms and that adults may move long distances of several kilometres to reach another forest. For example, frogs caught in the north of Ngangao Forest were found to be closely related to those in Mbololo.

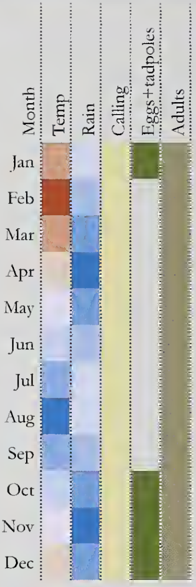
Outside of the Taita Hills, this species occurs over a large area of East, southern and Central Africa. It is predated upon by birds, snakes and even insects. In Taita it has been observed to be eaten by the White-starred Robin which also feeds them to its chicks.

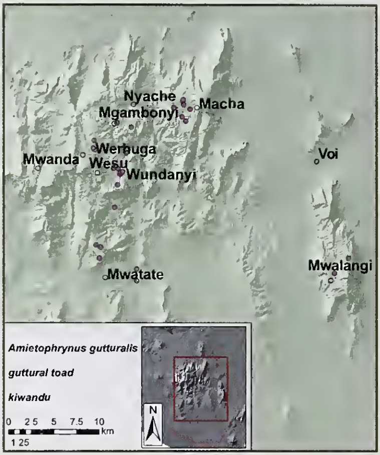


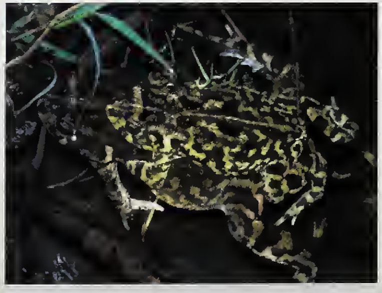
The eastern dwarf squeaker is often a very similar colour to dead leaves.

Notes

Amietophrynus gutturalis

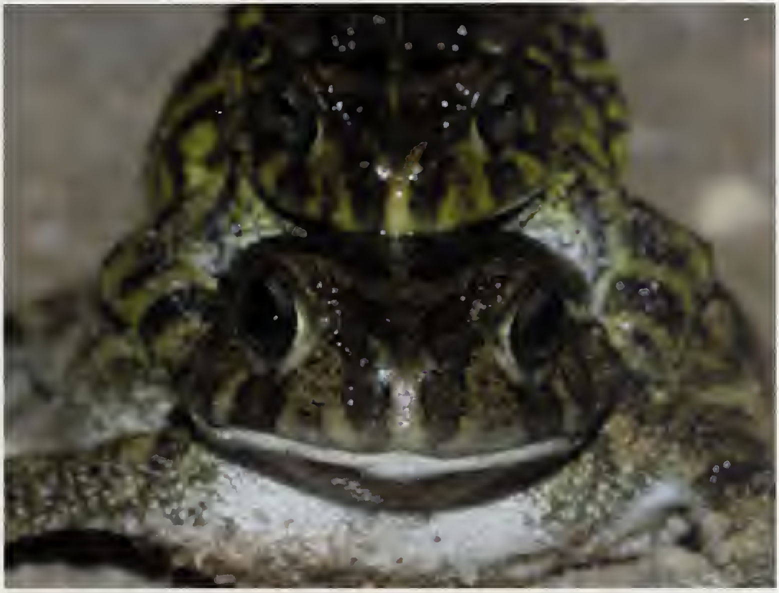






A pair of toads swim in a water-filled ditch selecting a site to lay their eggs.

guttural toad

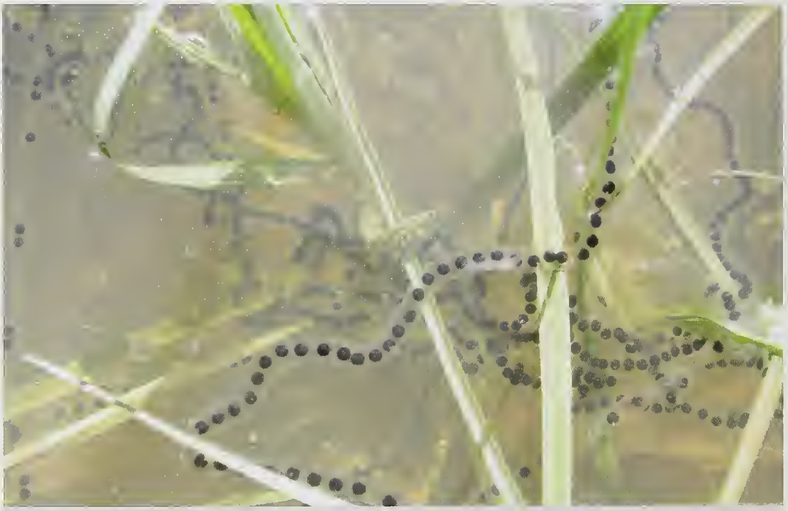


Once males have grasped a female they will hold on very tight to ensure that they fertilise her eggs.

This is one of the most familiar species of frogs to Taita people. It is commonly found around homes, in shambas, plantations as well as on forests edges. This explains its Kitaita name as the people's frog, kiwandu. This toad can be found in areas from the base at Mwatate to the heights of Vuria. One of the most spectacular sights is watching these animals come to lights at night to catch insects which are attracted there. On nights when termites fly this frog can be found gorging itself. Adults will eat just about anything that moves and will fit into their mouths, although most of their diet consists of insects, slugs and snails. On shambas they are a most welcome guest as they eat pests common on many crops.

Males call throughout the year, but are especially loud after the first rains in October and November. Their call is like a sawing noise 'rrrrrrr rrrrrrr'

Amietophrynus gutturalis (cont.)

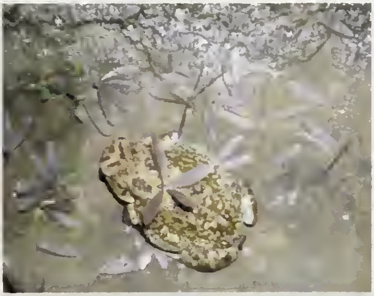


Eggs are laid in strings amongst vegetation.

and large choruses can be heard over long distances. Males call from inside breeding habitats, both permanent and temporary pools. Females are attracted to the calls and when approaching the chorus they are quickly grasped by males. Many males may try to grasp one female forming large balls of animals. Eggs are laid in long strings (bead-like) that have many thousands of eggs. The tadpoles hatch after a week and mass together as small, very black, forms. They have toxins which make them unpalatable to birds and mammals but are eaten by clawed frogs and aquatic insects.

After two months, small metamorphs begin to leave the water and move into the surrounding habitat. These can be so numerous that they carpet the ground in some areas and it is difficult to avoid stepping on them. Many fall prey to predators and their numbers reduce sharply over the following months as they disperse into the environment. At this small size they can be confused with *Arthroleptis xenodactyloides* (page 24) and *Phrynobatrachus scheffleri* (page 46). In addition, the lowland areas (Tsavo plains) surrounding the

guttural toad



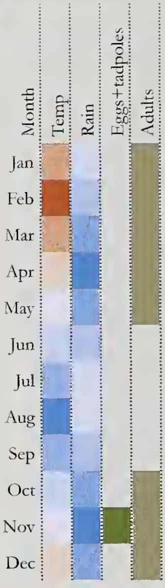
Individuals can often be seen around houses, especially if there is plenty of food available.

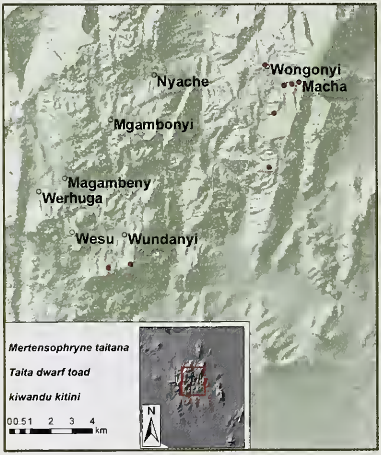
The tadpoles appear as very black forms with rounded bodies.

Taita Hills have two similarly sized toads *Amietophrynus garmani* and *A. xeros. Amietophrynus gutturalis* can be distinguished by the prominent cross on its head between the eyes. In Sagalla Hill this species co-occurs with *A. garmani* but this species has an unmarked face. *A. gutteralis* occurs from the Taita Hills and other highland areas of East Africa all the way south to Durban in South Africa and West to Angola.

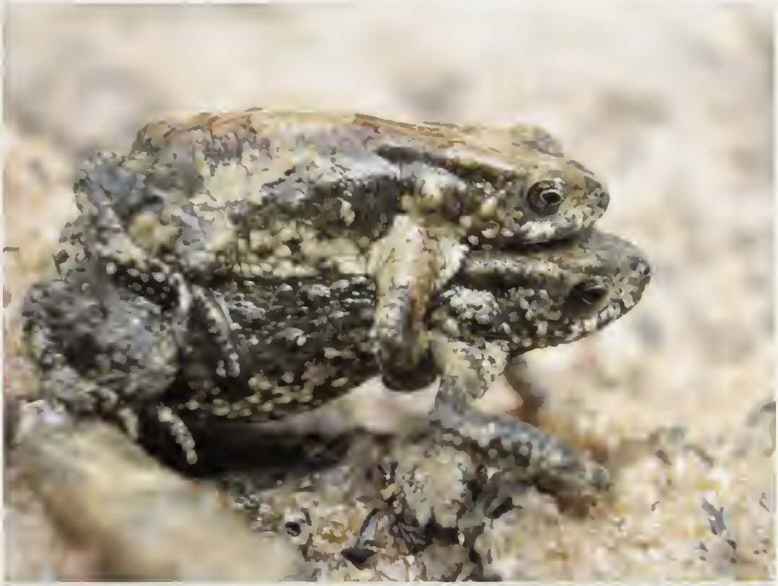
Notes

Mertensophryne taitana





Taita dwarf toad



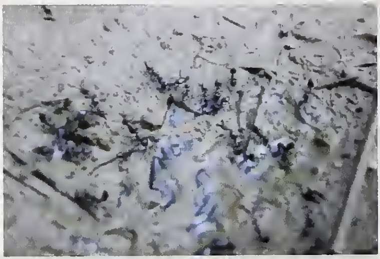
A pair of dwarf toads on their way to a road puddle to lay eggs.

The Taita dwarf toad was originally described from specimens caught on Mount Mbololo by Arthur Loverige in the 1930s, who gave it the species name *taitana*. Since that time, the same species has been found in parts of Tanzania, Congo, Zambia and Malawi. This species is very curious as, unlike most other frogs, males do not have an advertisement call. Recent work in the Taita Hills has found that if disturbed they will emit a small distress call (like many frogs), but no advertisement call has been heard. Instead both males and females congregate in puddles in the road during November, some weeks into the short rains (Vuli). These small toads (25 to 35 mm long) seem to congregate on a daily basis with eggs being laid in long strings (about 300 eggs per string).

The tadpoles hatch from the eggs very fast and bury into the mud at the sides of the puddle to feed there.

Mertensophryne taitana (cont.)

Strings of eggs are laid in the shallow water where they hatch into tadpoles and develop into frogs in around two weeks.



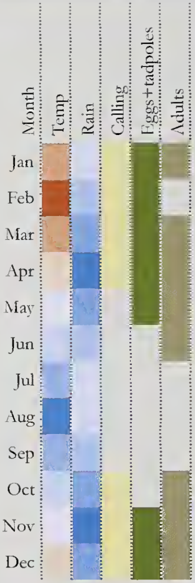
The road puddles often dry up leaving the tadpoles stranded to become food for scavengers such as these ants.

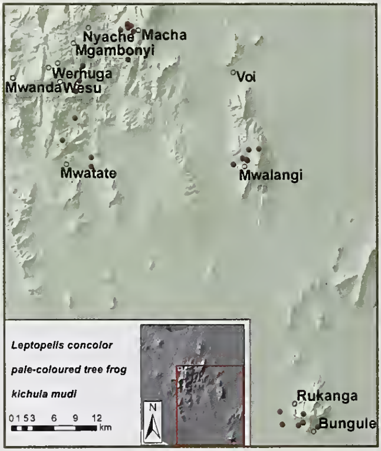
Each tadpole has a crown of tissue on its head that helps with the low concentration of oxygen in these puddles. The tadpoles transform into metamorphs in a very short period of time, around two weeks which is amongst the fastest recorded for any frog. Once they have bred, the small toads disappear into the surrounding area and are rarely seen again until the time they breed again in November. Some animals have been found on shambas, but little is known about this species away from its breeding site. The adults have a curious habit of sometimes walking on the tips of their toes. It is not known why!

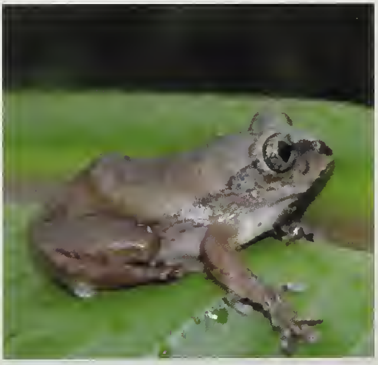
Most individuals have been found on Mbololo, and breeding has only been observed in puddles on roads. Outside of Mbololo there are a few records of this species in the Macha area. Otherwise, it seems to be absent from much of the Taita Hills.

Notes

Leptopelis concolor

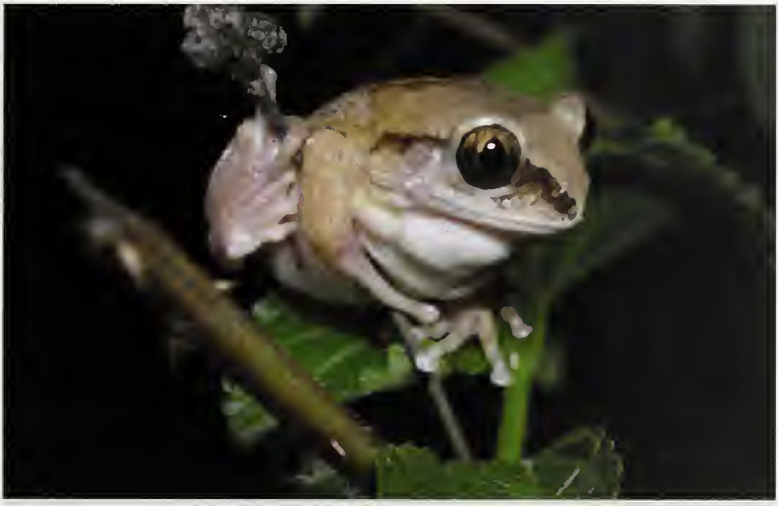






Large eyes are able to see in dim light and prominent discs on the toes are used to hold onto vegetation.

pale-coloured tree frog



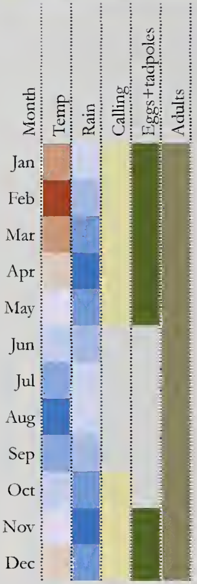
Males sit in vegetation at night to give their distinctive call.

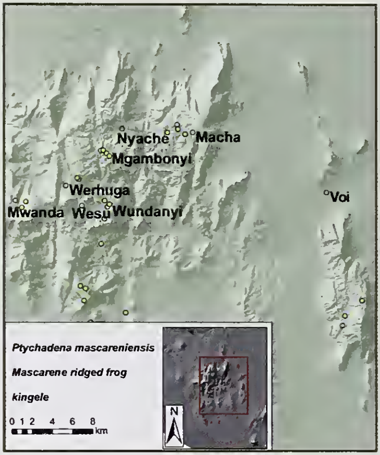
Known mostly from the lower areas of Taita, the pale-coloured tree frog is a common sight on most shambas with some water on them. Sitting at a height of around 1.5 m, males call from October to April on warm, wet nights. The call is made up of two components, first a loud 'quack' followed by three quieter, diminishing whistles. Eggs are laid close to, but outside of the water, usually directly above on vegetation. The small tadpoles then develop inside the egg and hatch falling directly into the water as free-swimming tadpoles.

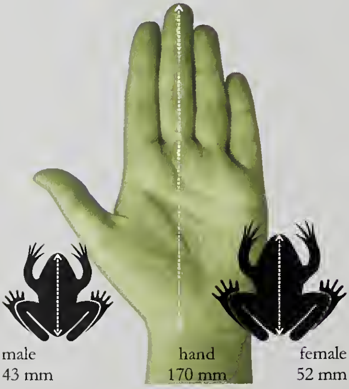
The adults are brown with a distinctive 'hourglass' pattern on their backs (like the dwarf squeaker, *Arthroleptis xenodactyloides*). They have very prominent eyes that appear to bulge out of their heads. They use these to search for prey in the low light levels of morning and evening.

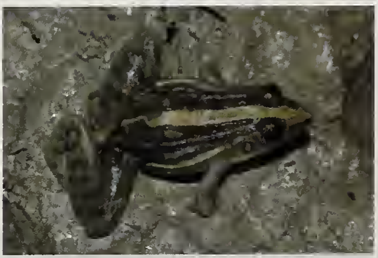
Although this species has a similar appearance to the reed frog, *Hyperolius glandicolor* (e.g. discs on toes, sitting posture), they are not closely related. The pale-coloured tree frog belongs to the same group of frogs as the dwarf squeaker.

Ptychadena mascareniensis



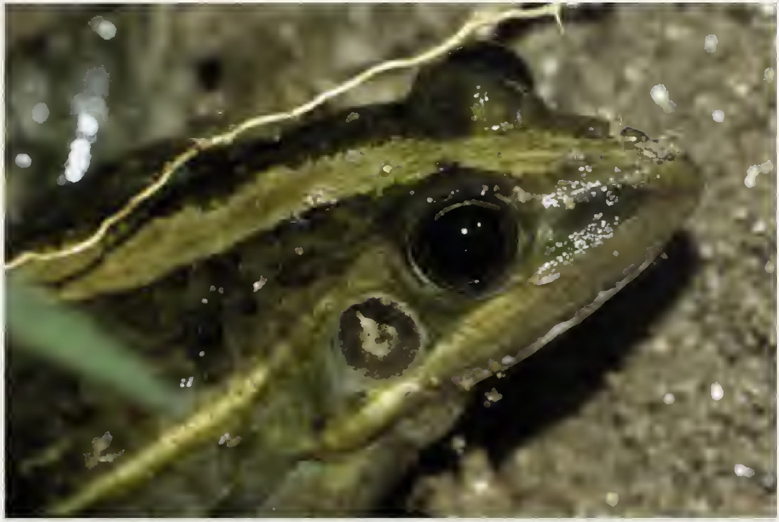






Ridged frogs can often be found next to irrigation ditches where they quickly jump into the water if disturbed.

Mascarene ridged frog

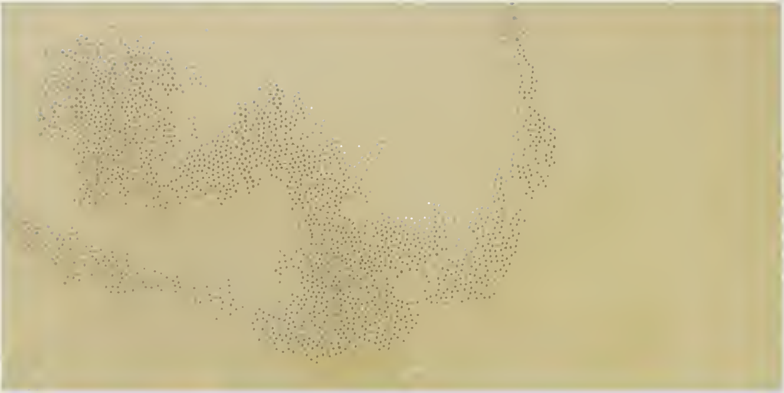


Ridged frog males have prominent eardrums behind their eyes. Beneath the ear is a slit where the vocal sacs emerge when they call.

While the ridged frog is very common it is often only seen briefly as it jumps out of vegetation into the water and swims away. If you can catch one, you will see quickly that it has a number of folds in the skin (or ridges) running along its back, giving this group of frogs their name: ridged frogs. During the day these frogs hunt at the edge of ponds or slow-moving streams and rivers, looking for small invertebrates to eat, which they catch with a flick of their tongue. If disturbed, they will immediately jump forwards directly into the water (if it is close enough). They are very good jumpers, capable of covering several metres in one jump.

Ridged frogs breed in the Taita Hills at all times except the dry months of June to September. Males have paired vocal sacs which inflate on either side of their heads, emitting a characteristic 'chrrr chrrr chrrr' that can be heard at a great distance. Females lay eggs which form a floating raft on the surface of pools

Ptychadena mascareniensis (cont.)



Eggs appear as a floating raft for up to a week before the tadpoles hatch and disperse into the water.

and develop into tadpoles which can be found even in roadside puddles. The tadpoles take two months to develop into small frogs which take another nine months to become adult size.

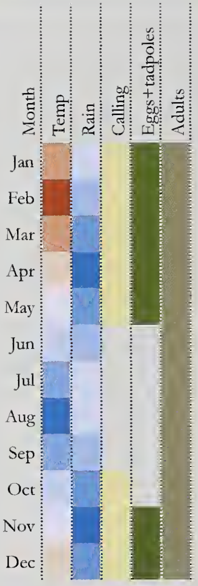
This frog is a great friend of farmers as it is abundant and eats many pests within the shamba. It is very similar to the Anchieta's ridged frog (see page 42) but differs in the Taita Hills by commonly having a stripe (cream-coloured, green or brown) running the length of their back to the tip of their nose. Males are smaller than females and can be recognised by the characteristic slits on either side of the head where the vocal sacs are stored.

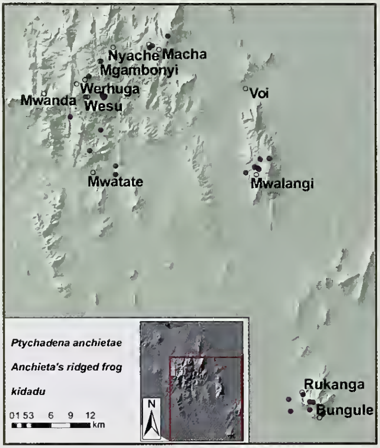
The tadpoles of ridged frogs grow their back legs first and can be found in a variety of colours.

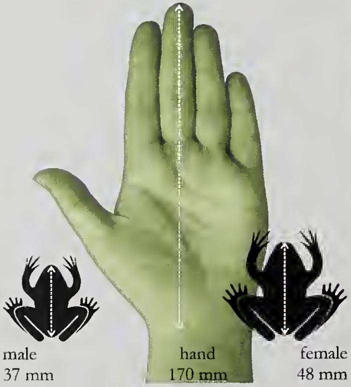
This species occurs widely outside of the Taita Hills in most of Central and southern Africa. However, genetic studies have shown that it is a complex of several different species, so the scientific name may change in the future. It is even found on some islands in the Indian Ocean and Madagascar. Although it has been introduced by humans to some of these places (including the Mascarene Islands from where it was described) it has arrived at others—probably by floating on large rafts of vegetation carried down rivers and into the sea.

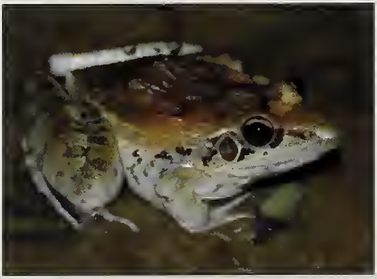
Notes

Ptychadena anchietae



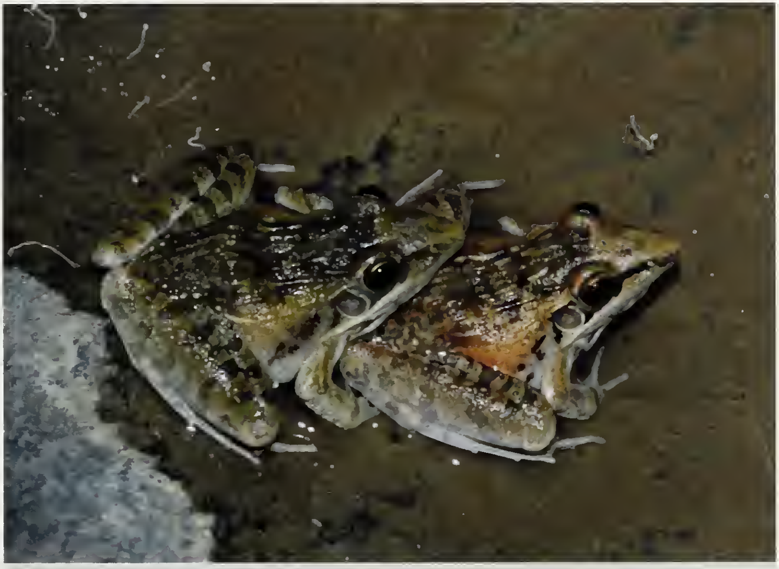






Anchieta's ridged frogs have a clear triangle with the base between their eyes running to the tip of the nose.

Anchieta's ridged frog

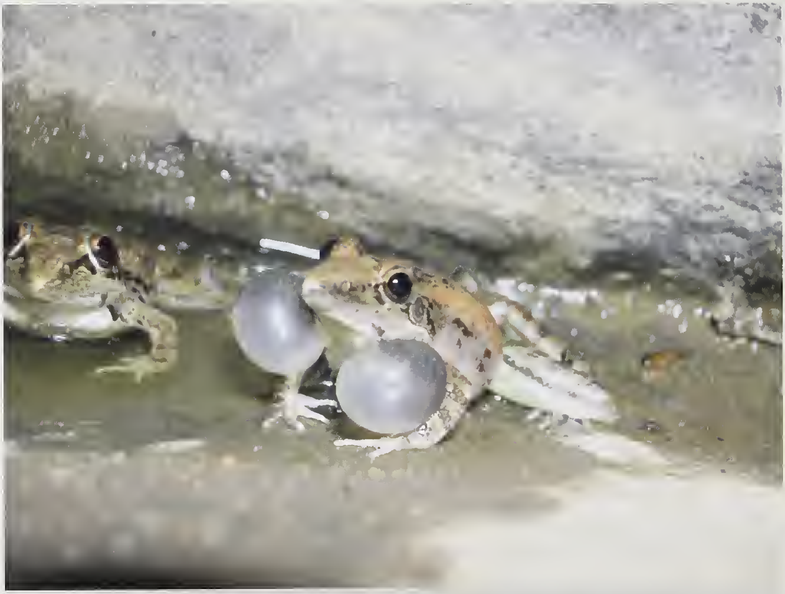


Anchieta's ridged frogs can be found sitting together at the edge of water at night.

This ridged frog is found in much the same kinds of places as the Mascarene ridged frog (page 38). However, this frog appears to prefer the lowland areas, whereas the Mascarene ridged frog occurs in greater numbers within the mountains. This frog is also a keen jumper which will jump out of the way as soon as it is disturbed. If it doesn't make it to the water on the first jump, it will either jump again, or disappear into the bottom of the grass and wriggle through the stems, making it very hard to find if you try to catch it.

This ridged frog breeds during all but the driest months (June to September) and in the same places as the Mascarene ridged frog; in ponds, pools and puddles at the side of the road. The calls that the males produce come from the same kinds of lateral vocal sacs either side of the head. The call they produce sounds very different and can help you

Ptychadena anchietae (cont.)



Males have paired vocal sacs which extend from slits in the sides of their heads.

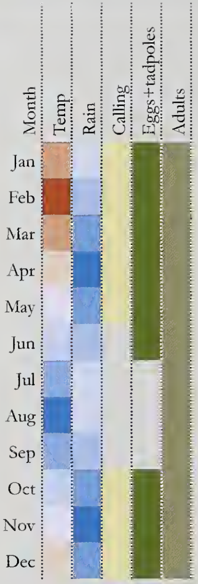
identify them as it sounds like a 'wah wah wah'.

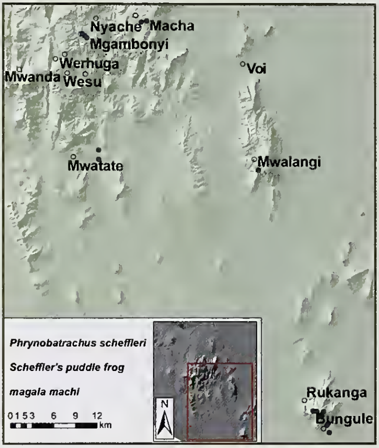
Widely distributed in East Africa, adults of this ridged frog can be distinguished from the Mascarene ridged frog by the characteristic triangle of paler skin that lies between the eyes to the tip of the nose. This species is also a friend to Taita farmers as during the day it eats small invertebrates which may damage crops.

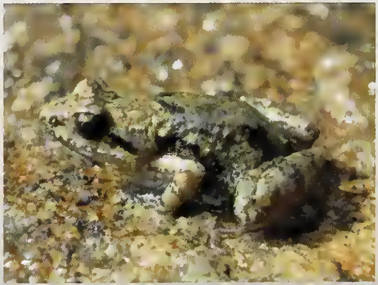
The embryos of ridged frogs develop inside the jelly capsule which floats on the water.

Notes

Phrynobatrachus scheffleri

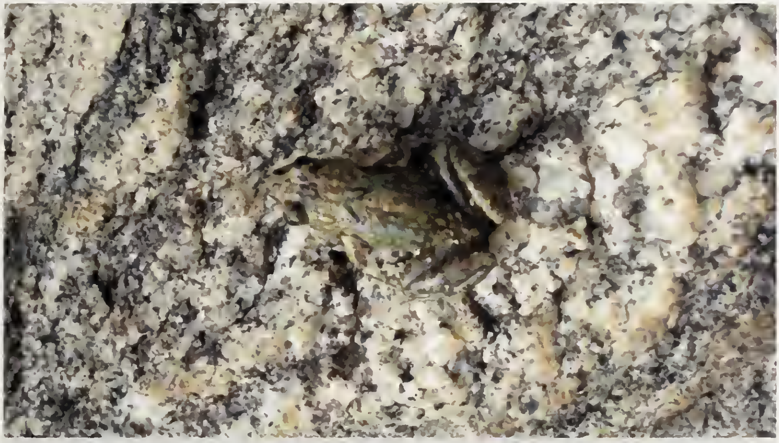






Scheffler's puddle frogs are very small and usually found next to streams in shady areas.

Scheffler's puddle frog



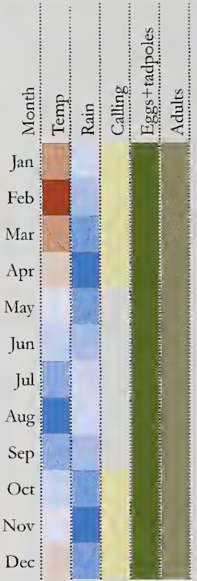
Scheffler's puddle frogs have a distinctive pair of elongated bumps arranged in a V on their back.

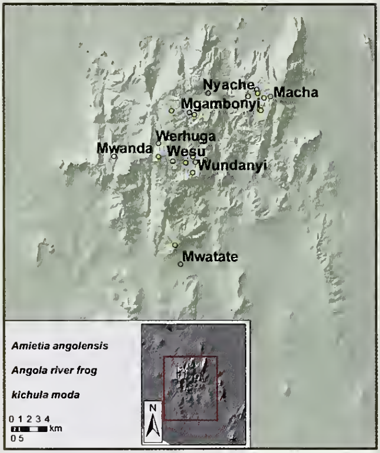
These are one of the smallest species of frogs that occur in Taita, the largest adults are only 22 mm long. They can be most easily found next to small streams and seepages in grassy streams, wooded areas and forest. They hop quickly about in the mud or sand at the side of the stream catching any flies or other small insects that might land there. This species can be confused with *Arthroleptis xenodactyloides* (page 24), except that it has distinctive raised marks forming a V pattern on its back.

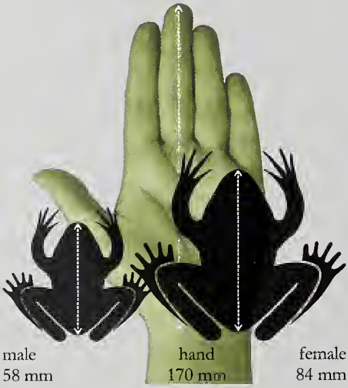
Males call from concealed positions close to breeding sites with a series of short buzzes, 'bzzz bzzz bzzz'. This species lays eggs singly floating in small puddles at the edges of streams, especially those that have formed during spates of rain. The tadpoles grow within the puddles and metamorphose into juveniles which can also be found at the side of the stream.

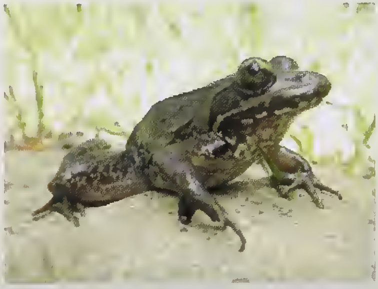
This species occurs in much of East and southern Africa, but it is believed that there may be more species than are currently recognized.

Amietia angolensis



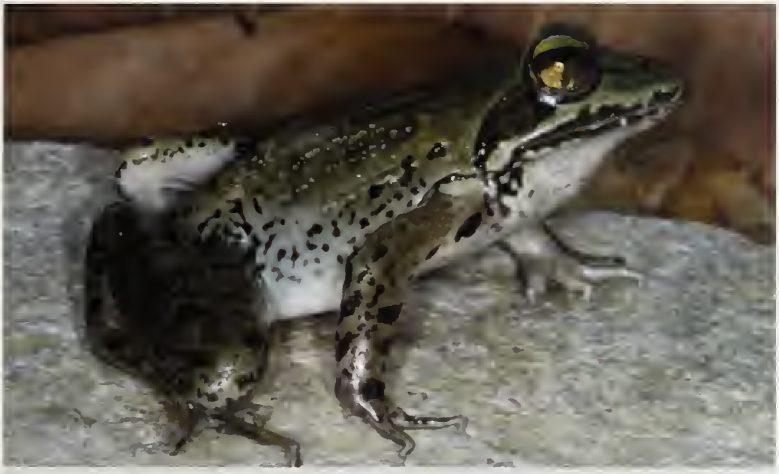






Males can be found sitting at the edges of rivers in prominent places.

Angola river frog



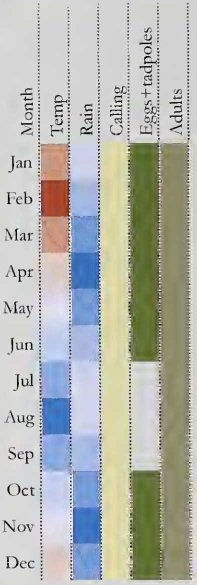
These are large frogs which have powerful back legs for swimming against the current of streams and rivers.

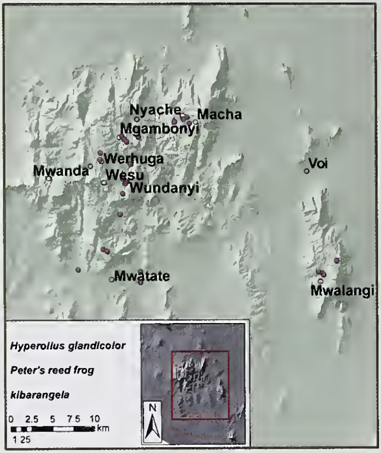
This is a large frog (up to 90 mm long) which can often be found along edges of large streams and rivers. The adults can be found along the banks throughout the year. Males call during both rainy seasons in a series of 'chirps' followed by some 'croaks' often from sheltered spots under river banks or even floating in the water. If disturbed they jump quickly into the water and are strong swimmers with prominent webbed feet. Their brown and greenish blotched appearance blends in well with both mud and vegetation.

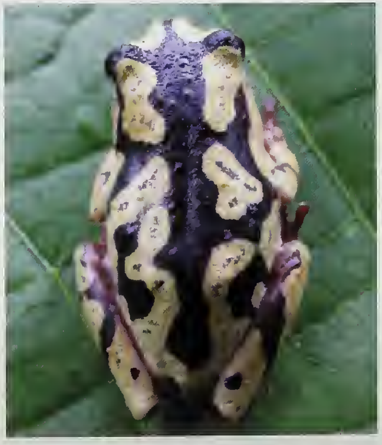
Pairs of frogs lay single eggs in small still areas in streams from October to April. The tadpoles live in the same areas but may travel up or down stream to disperse. In the Taita Hills they take two years before they metamorphose into frogs, growing to a very large size (up to 60 mm long). If you find a very large tadpole in quiet waters of a stream or river in the Taita Hills, it is almost certainly the Angola river frog.

In the Taita Hills, adults of this species can be found in all of the permanent streams and rivers. Tadpoles have been found in slow moving streams as well as in dammed ponds for community water schemes.

Hyperolius glandicolor

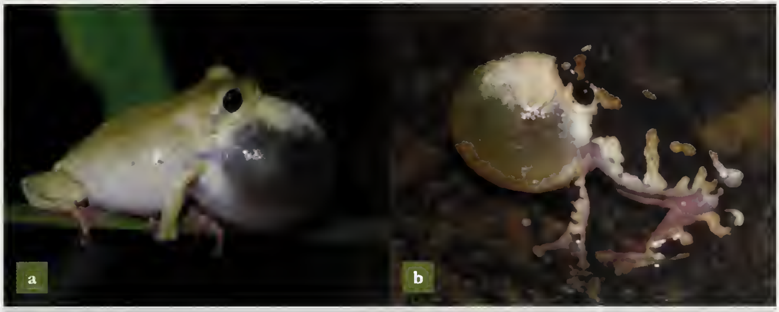






A female reed frog showing typical black and yellow colouration.

Peters reed frog



Males have a large sac which is inflated when they call. Males have two distinct colour morphs, a typical brown (a), and black and yellow which is similar to females (b).

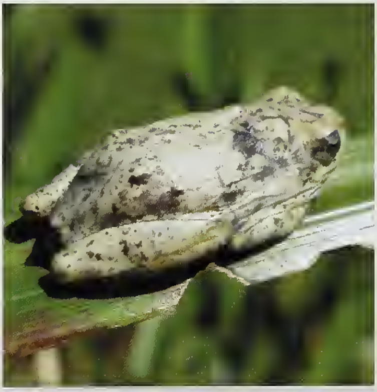
The reed frog is probably one of the most familiar amphibian species in the Taita Hills. It lives close to permanent water or temporary pools, although adults and juveniles can be found at some distance in forest and shambas alike. During the day these frogs are able to withstand full sun by sitting with their legs close to their bodies to minimise water loss and even turn a very pale colour to reflect the heat. During evening hours or after rainfall they come alive, males sit close to the water on reeds or grasses, extend their large vocal sac and emit a very distinctive 'bwoep'. When many males are singing in a chorus the noise can become almost deafening. Males have two colour patterns, a normal brown and black with yellow reticulation, which is the pattern more typical of females. Calling males are territorial and if another male comes too close they emit a distinctive warning 'croak'.

The reed frog breeds in both rainy seasons, and males can be heard calling throughout the year, especially after rain. Females can be found in the surrounding area until they are ready to mate. They then move towards and select amongst calling males and once in amplexus move to lay their eggs in a cluster on leaves close to the water surface. The eggs develop out of the water and tadpoles finally drop into the water once hatched. The tadpoles develop over a period of weeks until the young metamorphs leave the water and move off into the surrounding area to grow.

Hyperolius glandicolor (cont.)

These frogs have many natural predators including insects, spiders, birds as well as snakes like this white-lipped herald snake (*Crotaphopeltis hotamboiea*).

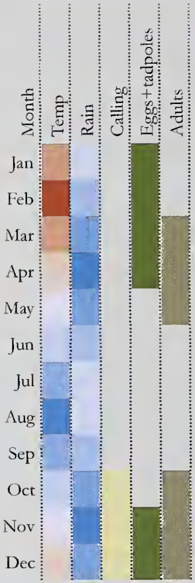
This species is distinctive due to its coloration and its smooth plastic-like shiny skin. Its toes and fingers end in discs which help the animal climb and stick to reeds and grasses. The insides of the legs and ends of the toes are often tinged pink or red. This species can be confused with *Leptopelis concolor* (page 36) and *Chiromantis petersii* page 56). However, it is smaller than both these species and is the only one with black and yellow patterned females. This species occurs in a large area outside of the Taita Hills, but appears to be closely related to many other species in the same genus.

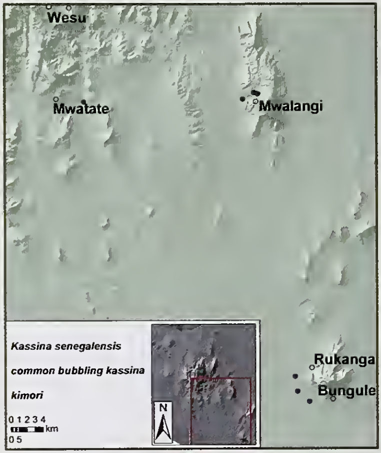


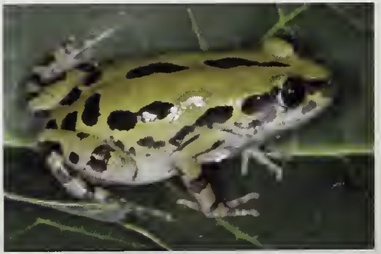
The skin can appear to be very dry and individuals can tolerate exposure to the sun during the day.

Notes

Kassina senegalensis

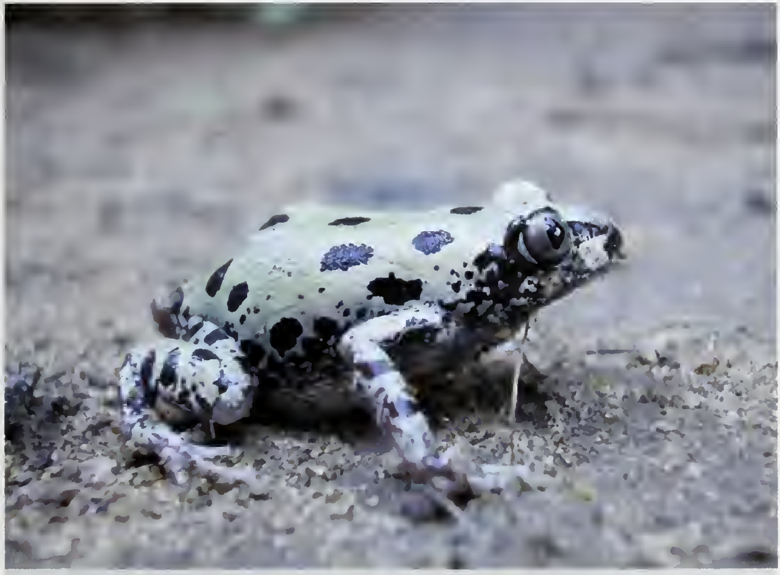






Black markings on the bubbling kassina can vary from lines to spots.

common bubbling kassina

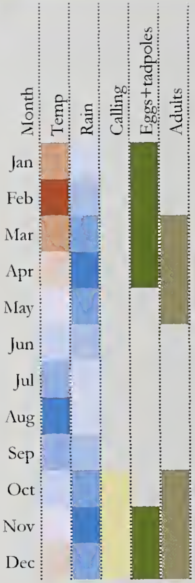


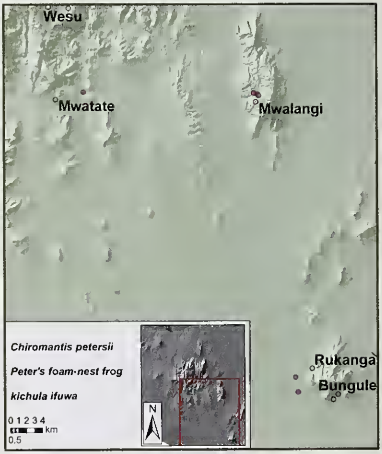
These frogs can be very hard to find as they hide deep in vegetation at the sides of ponds.

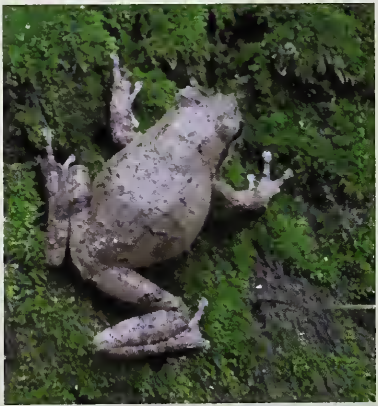
The common bubbling kassina is a very distinctive looking frog, the background is an olive-green colour, which can look almost gold, and is covered with regular black spots, each of which has a white ring around it. In the Taita Hills, males have been heard calling in the height of both rainy seasons, March and November. Males call from shallow water around dams or swamps hidden deep under patches of vegetation. The noise sounds like a series of bubbles rising up from the water, and this gives it the common name: bubbling kassina. Eggs are laid in similar areas where males call in small masses. The tadpoles are also rather distinctive with a high fin.

In the Taita Hills, this frog occurs in the lowland areas, including Sagalla Hill. It is widespread in sub-Saharan Africa, where markings can vary from spots (in Taita Hills) to stripes (elsewhere) running down the back.

Chiromantis petersii

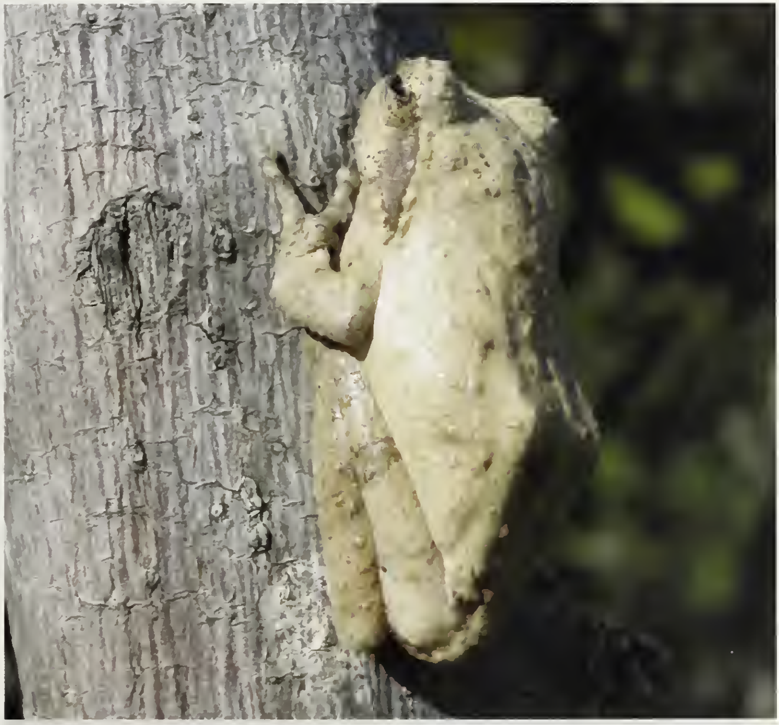






These frogs have very distinctive feet with toes that can grip stems of plants.

Peter's foam-nest tree frog



You can find these frogs sitting in full sun during the day when they can appear almost white.

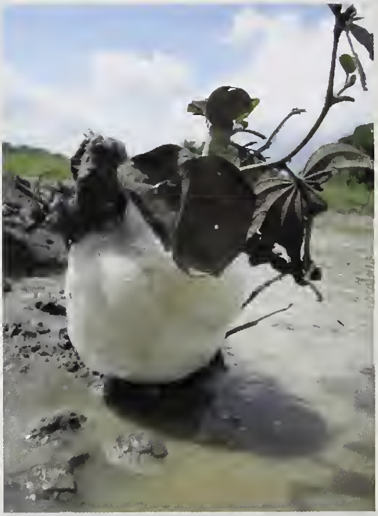
This frog lives mostly in the lowland areas around the Taita Hills, and throughout East Africa, although animals can be found on Sagalla at 1 000 m asl. It can be most easily found around dams, pools and swampy areas, where males call from perches on reeds and bushes. The call is a distinctive 'chirp' followed by musical pulses.

If found in full sun, a Peter's foam-nest tree frog can appear almost white, and is hard to confuse with other species. The hands have opposable fingers, with pads like the

Chiromantis petersii (cont.)

reed frogs, but are much bigger. The skin often appears rough with warts

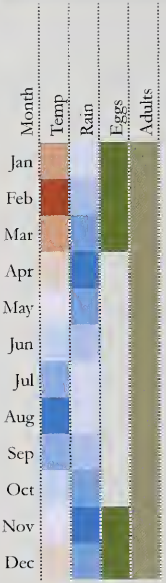
When males and females mate, the female secretes a sticky substance which she whips up into a foam with her hind legs. Enough foam is whipped to make a nest the size of a football, which overhangs the water. The pair then lay eggs into the centre of the foam nest and the foam dries and hardens on the outside, while remaining moist in the centre. This protects the eggs from drying in the sun, while the bad-tasting foam prevents them from being eaten by predators. Once the eggs have hatched, the tadpoles drop out straight into the water to feed and grow.

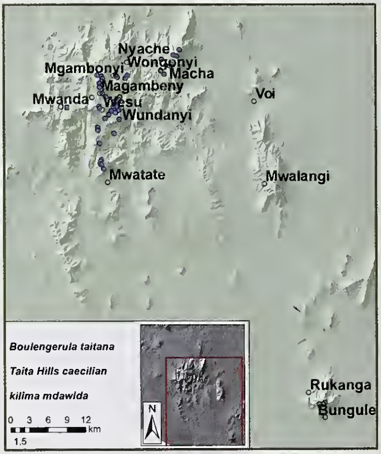


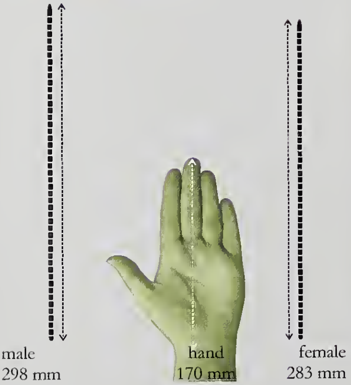
A typical foam nest at the side of a large pool.

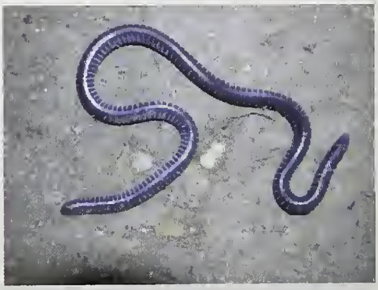
Notes

Boulengerula taitana







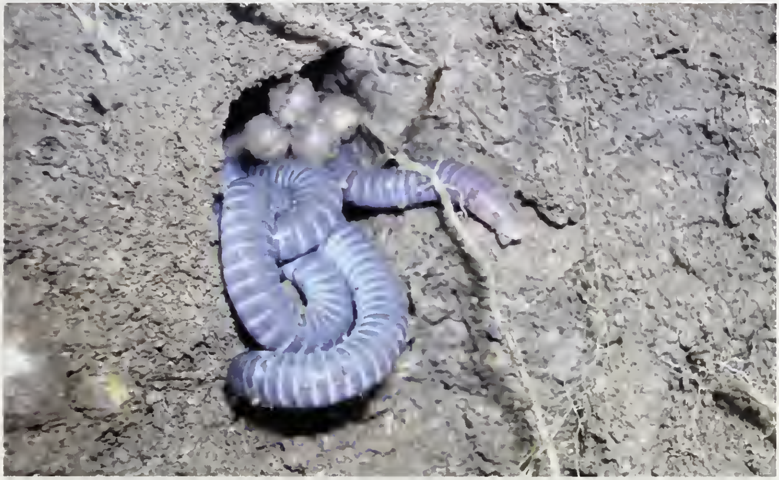


An adult Taita Hills caecilian looks out of place on the ground; naturally they live in the soil where they move around through burrows.

Taita Hills caecilian

Vulnerable

Taita endemic

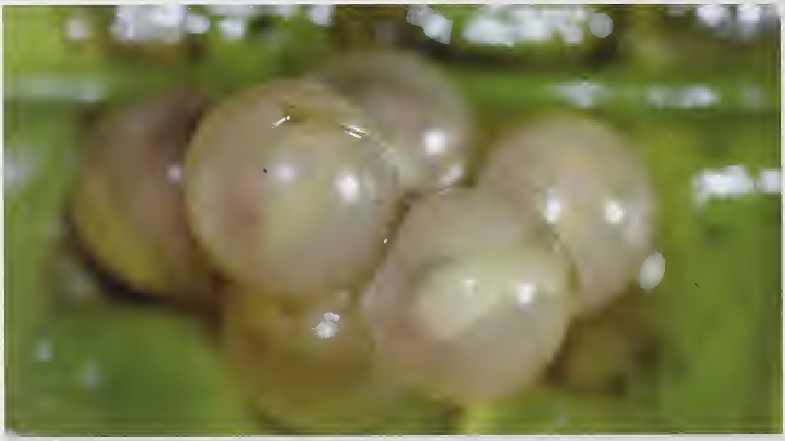


A female Taita Hills caecilian broods her eggs in a subterranean burrow.

This species is regularly called 'mng'ori' or earthworm, but it is not an earthworm but a different type of amphibian (order Gymnophiona—see page 8). This species lives only in the Taita Hills (Dawida, Mbololo and Kasigau), above 1 000 m. It does live in much the same black, fertile soil that you also find earthworms as it feeds principally on earthworms and termites. They have been found in very high densities on some shambas, especially where there are bananas growing, but they also occur in natural forest and even in some plantations if the soil is moist enough. This species appears to be limited in its distribution by soil moisture and so does not occur low down or in the dry rain shadow areas (see page 4).

This is a direct developing amphibian (see page 10), laying eggs in small brooding chambers where the female guards them and turns them until they hatch. Once hatched the small

Boulengerula taitana (cont.)



The eggs of this species are joined with a string. The direct developing young can be seen inside curled around a yellow yolk.

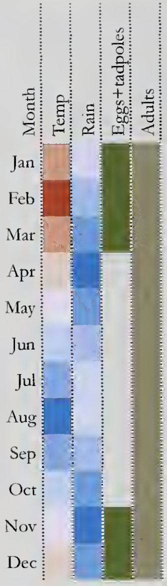
pink juveniles have special teeth that are adapted to eat the skin from the mother's back. This skin is believed to be especially nutritious for the young to grow quickly. By the time the young are ready to burrow independently in the soil they have changed to the distinctive black-blue colouration of this caecilian.

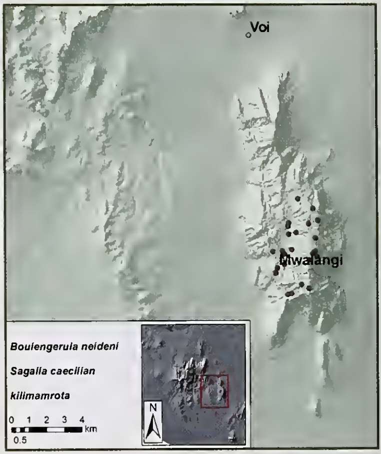
Having caecilians in your soil suggests that you have a good and fertile shamba. They are the farmers' friends as they eat a number of insect pests which may attack crop roots. The skull of the Taita Hills caecilian has no orbits for eyes, which are very small and can probably only tell the difference between light and dark. The adults have three fearsome rows of teeth (although they don't bite people!) which they use to hold onto their prey while they spin in their burrows. Although the adults are nearly blind, they may be able to gauge the size of their prey by the amount of force required to spin it.

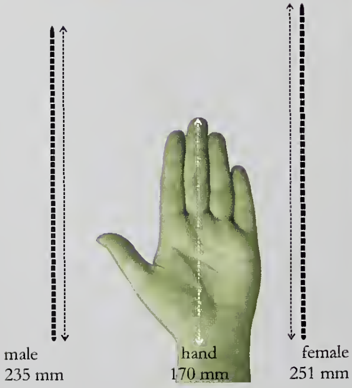
As this species is endemic (see page 3) to the Taita Hills and is vulnerable to soil erosion, it is considered to be threatened. You can help ensure the future survival of this species by preventing soil erosion and keeping your shamba free from pesticides and herbicides, that might harm them.

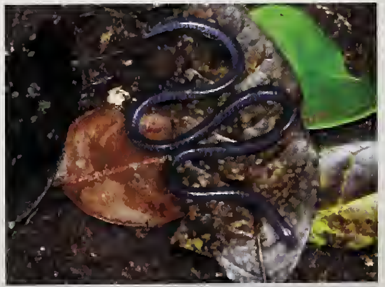
Notes

Boulengerula niedeni







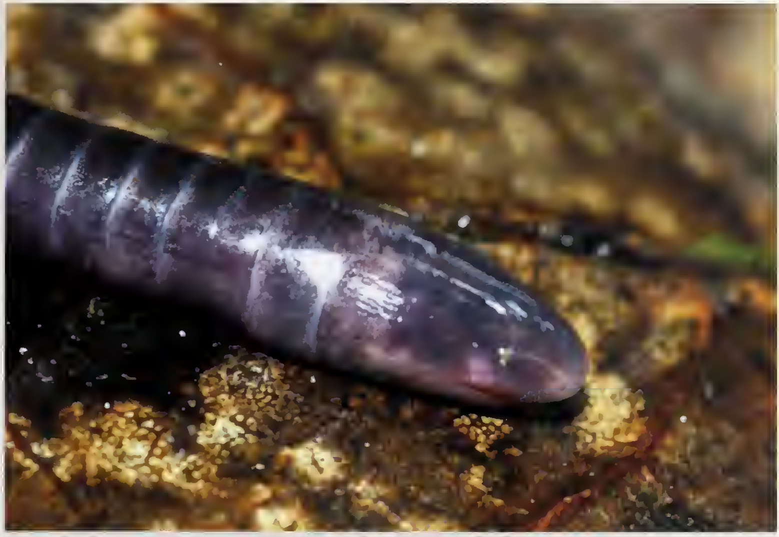


The Sagalla caecilian can occasionally be found above ground, especially when escaping from army ants.

Sagalla caecilian

Critically Endangered

Taita endemic



The heads of these caecilians have no visible eyes, the mouth is recessed under the head, and a small pair of tentacles feel the edges of the burrow.

The Sagalla caecilian is a different species to the one that occurs on the other mountains in the Taita Hills. The scientific description was only made in 2005, but previously Sagalla people thought of this animal as 'mng'ori' (or earthworm). Now this caecilian has a new kiSagalla name: kilimamrota. As the name suggests, this caecilian only lives on Sagalla, and like the other caecilian, it only lives in areas that have moist and fertile, black, soil. This means that many areas of Sagalla are unsuitable, including the eucalyptus plantation and the lower dry areas.

There is very little known about this species, but we think that like the other Taita caecilian, it breeds in 'Vuli', the short rainy season, laying eggs in a small burrow in the soil.

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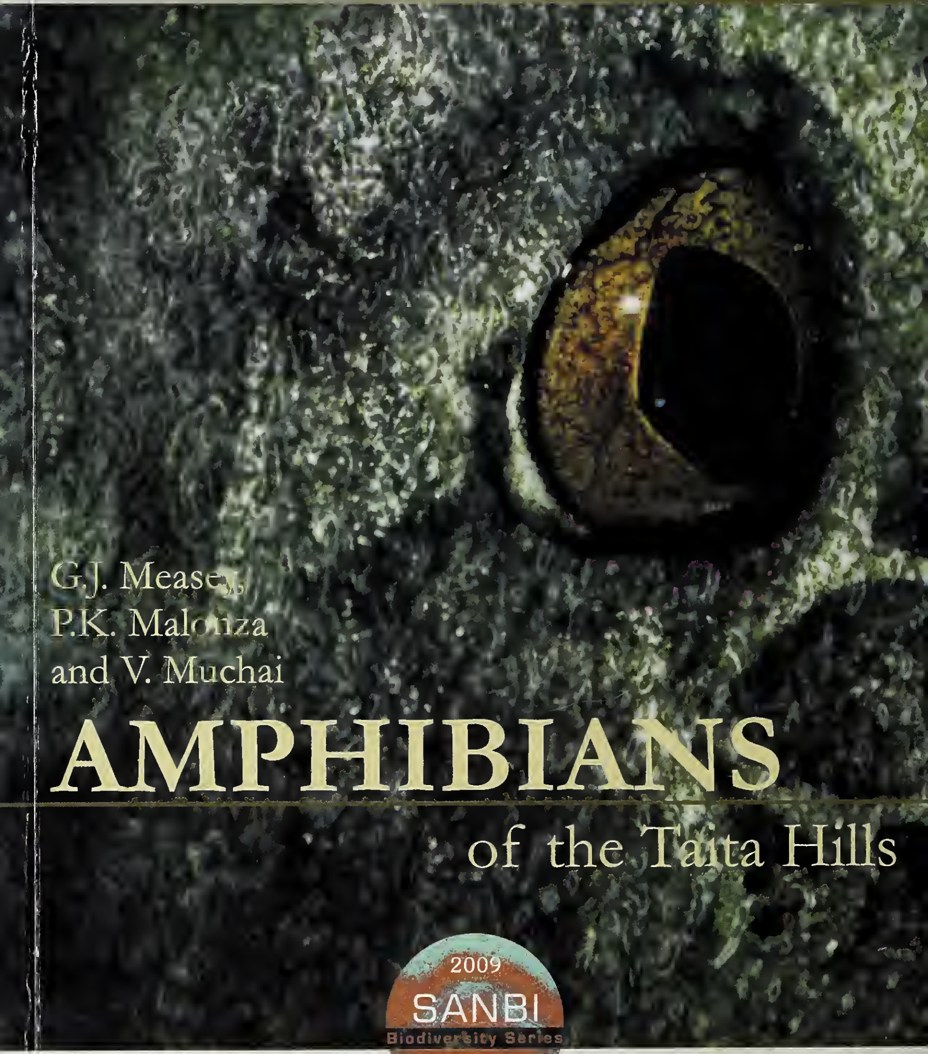

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AMPHIBIANS

of the Taita Hills

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